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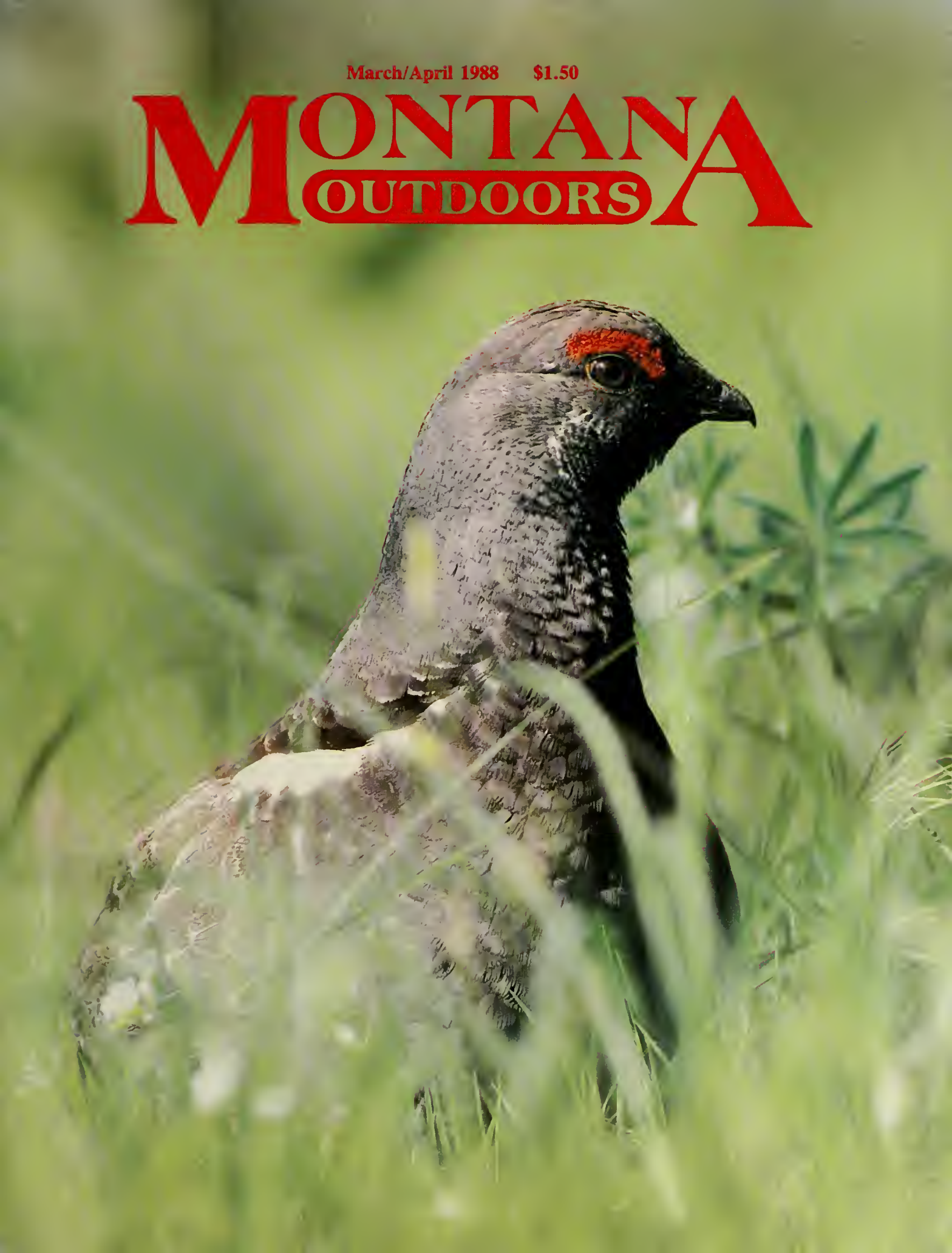
MONTANA OUTDOORS



Robert Bateman.

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MONTANA OUTDOORS

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COVERS

Montana's mountain foothills are full of springtime surprises and color-filled delights, such as the blue grouse snapped for our front cover by Kathryn Meade. The inside front cover features Robert Bateman's "Peregrine Falcon and White-Throated Swifts " (©1985 Robert Bateman. Courtesy of the artist and Mill Pond Press, Inc.; Venice, FL 34292). Peregrine restoration has been Montana's greatest success with an endangered species. Many different forest worlds exist—different trees, different soils, different plants and animals—and each kind of forest offers different opportunities for use and enjoyment. That proves that "Forests Are More Than Trees," the theme for this year's National Wildlife Week, March 20-26.

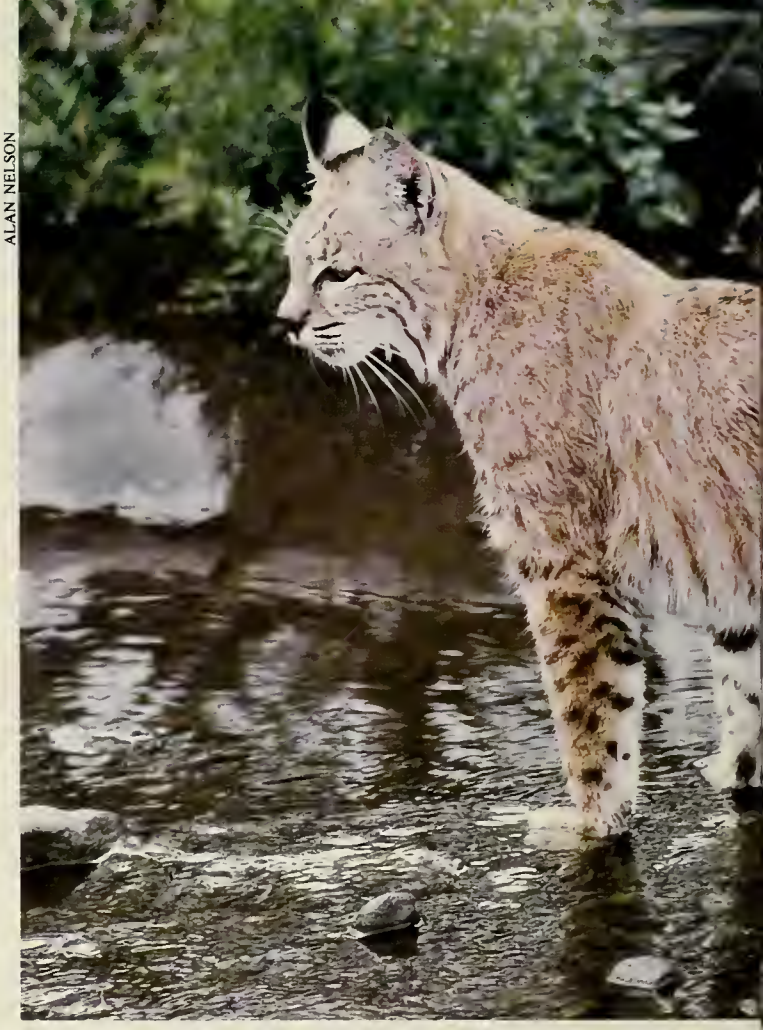
"There are THREE just below us!" I yelled into the headset microphone. At that same moment the Piper Supercub was banking hard to the right. Despite the constant drone of the single engine and the pulsing, high-pitched "beep...beep...beep" in my headset, I succeeded in directing the pilot to the correct location. There was movement below as we circled over a deeply eroded, sagebrush-lined coulee. Then suddenly, on the eastern rim, three bobcats scurried for cover. A complex of deep sinkholes, carved in the highly erodible soil of the coulee, provided a secure retreat.

With the aid of a small plane, a skilled pilot, and radio telemetry, I had been able to pinpoint the location of a radio-collared bobcat and her two kittens. It was summer 1983, and I was in the early stages of conducting research for a bobcat ecology study in southeastern Montana for the Department of Fish, Wildlife and Parks (DFWP). The study was part of a statewide effort directed at better understanding the habits of bobcats throughout Montana. Results from this research would be used to improve the state's management of the species.

Many people are surprised to learn that the bobcat, *Lynx rufus*, thrives on the eastern Montana prairie. In fact, some of the best bobcat habitat in the state lies within the steep and rugged river breaks of eastern Montana's river valleys. This relative abundance of bobcats in eastern Montana is reflected in the DFWP's harvest regulations which indicate general population densities across the state. In examining the 1987-88 harvest limits for each of the seven trapping districts, five bobcats can be taken in the southeastern district, compared with only three in the central districts, and two in the western districts.

Regional bobcat quotas have also been implemented to ensure that the species is not overharvested. These range from 600 in the southeast to 150 in the west.

But before we get into the details of bobcat management and results of the southeastern Montana study, let's take a quick look at the bobcat itself.



ALAN NELSON

PRAIRI

Distribution and Life History

Bobcats in central and eastern Montana occupy the sagebrush and grassland prairie where it is dissected by deep coulees, creek drainages, and river valleys, or broken by an isolated mountain range or low-elevation badland hills. Den sites are found in rocky outcrops and eroded sinkholes. In contrast, bobcats in western Montana typically inhabit heavily timbered coniferous forests, preferring the brushy riparian areas that straddle most mountain streams. They select rocky areas, such as ledges and outcrops, for den sites.

Female bobcats become sexually mature between 1 and 2 years of age. Males are usually able to breed during their second year. Peak breeding season for bobcats in Montana is during February and March. The gestation period is about 62 days, so kittens are born in the den during April and May. As with all species in the cat family (Felidae), bobcats produce only one litter annually. Litter size varies, but research in Montana indicates that each adult female produces an average of three kittens. Kittens weigh less than a pound at birth and are born with their eyes closed. They first view the den's interior about 10 days after birth. Bobcat kittens are weaned in eight weeks, although the young do not leave the female until late fall or winter.

Behavior and Food Habits

Because bobcats are "crepuscular"—most active in early morning and late evening—your chances of spotting one are best at these times when the animals are traveling or hunting. Primary prey species are cottontail rabbits in eastern Montana and snowshoe hares in the western part of the state. Additional food items in the bobcat diet are, of course, mice—and surprisingly, an occasional deer or antelope. Like most carnivorous predators, bobcats are opportunists. They will attempt to take almost any animal that presents an easy meal. Under extreme conditions—such as when rabbits reach the low

E 'CAT

by Brian Giddings

Between Miles City and Jordan lies a section of prairie that supports some of the highest bobcat densities in the state.

point of their well-documented population cycle—bobcats will take advantage of whatever alternative prey species are available.

Bobcat Research in Montana

At this point, let's briefly examine the events that led up to the exciting research opportunity described at the beginning of the article.

In 1973, the Convention on International Trade in Endangered Species (CITES) convened with 89 member nations to promote international cooperation for conservation of rare and endangered flora and fauna. As a result of the convention, most of the large spotted cat species of the world were listed as "endangered." The listing resulted in a ban on the world export of these spotted cat pelts—primarily leopards and cheetahs.

To ensure that species of smaller cats would not follow population declines associated with a shift in trade pressure from the ban on large cats, all remaining wild members of the cat family were listed as "threatened" under CITES in 1977. As a member nation, the United States now was obligated to regulate the export of bobcat pelts. Exports would be allowed only from states demonstrating the ability to manage the species to satisfy CITES requirements. For biological information, these requirements included: (1) population trend data, (2) total harvest data, (3) harvest distribution data, and (4) habitat evaluation. Minimum requirements for a management program were: (1) a controlled harvest, (2) registration and marking of all pelts, and (3) annual determination of harvest objectives. Without meeting these requirements, a state could not export pelts.

To meet this shift in market demand, export of bobcat pelts from the United States began to increase during the 1970s. This caused a dramatic rise in the price of U.S. bobcat pelts. Average pelt price in Montana jumped from $55 during 1974-75 to $316 in 1978-79. Top-quality pelts sometimes brought over $500.

Most states began to reclassify the bobcat as a game animal or furbearer instead of a predator during the late 1970s because of the changing biological, economic, and political climate associated with the species. Predators were becoming recognized for their biological role in ecosystems. Also, with the value of bobcat pelts rising, states realized the economic value of the fur harvest. In addition, states were motivated to comply with export regulations under CITES.

This happened in Montana in 1977, when the Legislature moved the bobcat from "predator" to "furbearer" status. This reclassification provided limited protection and delegated responsibility for bobcat management to the DFWP.

The current DFWP bobcat management program began in 1977 with appointment of a statewide furbearer biologist. To monitor the export of Montana pelts, one of the early management objectives was to impose a mandatory bobcat pelt-tagging program. The next step was to determine population densities and bobcat distribution in the state from harvest and observational data before initiating specific research projects. Then, from 1978-82, the DFWP imposed a mandatory bobcat carcass collection program aimed at identifying specific biological parameters needed to manage the species properly. This included examining sex and age structure, food habits, reproductive status and history, and general health.

In 1979, specific research projects were initiated to survey the basic bobcat habitat types in Montana, starting with a bobcat ecology study in north central Montana on the Charles M. Russell National Wildlife Refuge. Research was directed at habitat selection, home range size, and movements. During the same period, the DFWP began a five-year study designed to examine the ecology of bobcats and lynx in several areas of western Montana. During the first few years of this project,

researchers looked at bobcat home range size, movements, and habitat use. Researchers investigated denning ecology, along with kitten survival and dispersal during the last two years. Both studies have been completed and the information incorporated into management decisions.

Southeastern Montana Study

Between Miles City and Jordan, northern Rosebud County comprises a vast expanse of broken prairie rangeland and associated dryland wheat farms. The area is characterized by an undulating sagebrush and grassland prairie, dotted with stock reservoirs and interspersed with rugged badland hills and ridges that rise 300 feet above the prairie floor. Only sparse vegetation is present on these shale and clay hills. Waters that flow through deeply eroded coulees and creek drainages eventually flow into the lower Yellowstone River. Because this area represents the prairie habitat typical of southeastern Montana, it was chosen as the study site. Here, the prairie provides prime bobcat habitat that supports some of the highest densities in the state, and our chances to observe and record the habits of a number of bobcats were excellent.

From this study, the DFWP wanted to learn the answers to three specific questions that would provide important information for managing bobcats. The first question referred to home range size. A home range is the area in which an individual animal can find the essential requirements for survival, primarily food and cover. Home range size also reflects habitat conditions and indicates population densities; in general, the smaller the home range, the higher the habitat quality, and vice versa. A second question addressed movement patterns. How far does a bobcat travel in a day, a season, or a year? Also, how extensively do bobcats travel during the breeding season? The third question was especially interesting: How do bobcats use the prairie habitat? Do they use various habitat components in proportion to their availability? What habitat types are used most extensively?

To answer these questions, the first step was to capture and mark a number of bobcats within the study area. Animals were captured using leg hold traps and then tranquilized. Eight individuals were trapped and radio collared during spring of 1983. Use of radio transmitters provided a unique opportunity to monitor individual bobcats moving in the freedom of their own environment. Ground and aerial tracking were used to monitor the marked animals.

Flying became the most efficient method to relocate study animals. The aircraft was fitted with a directional antenna mounted on each wing strut. Using a receiver, with the aid of a switch box, I could determine which side of the plane the signal was coming from simply by switching from one antenna to the other. By following the strength of the signal, then circling above the bobcat and using only one antenna, I could pinpoint the animal's location.

As with any telemetry study, the primary objective was to get as many relocations as possible to establish home range boundaries and movement patterns of individual bobcats. By relocating an animal on a regular basis over a period of time, I could begin to delineate an area of use by plotting locations on topographical maps. Location coordinates could later be entered into a computer and analyzed using a program which calculates exact home range size and constructs home range boundaries.

Density estimates confirmed that the population was one of the highest in the state. Average home range size was fairly small (14 square miles). However, it appeared that a home range could change dramatically in size, depending on changes in prey densities and breeding behavior.

An interesting piece of data indicated that bobcats used "core areas" within their home ranges. These areas had one common variable: They were located in the most rugged terrain within each home range. These areas characteristically provided excellent security cover (sinkholes) and abundant prey. With this in mind, it appears a bobcat home range may represent the area required to meet changes in environmental conditions, such as fluctuating prey densities, and to optimize breeding opportunities. Yet, the core area represents a space within the home range that meets minimum survival requirements.

Bobcat movement patterns became more obvious as the number of relocations began to accumulate. The year was broken into the standard four seasons to calculate seasonal movements. Distances over time were calculated by use of a computer program designed for that purpose. Radio-collared bobcats traveled the greatest distances in winter and spring. This probably relates to breeding activities and a decline in prey densities during the study period. Shorter movements occurred during summer and fall. Movements are most likely restricted while females are rearing and raising young.

Each time an animal was found, the vegetation type that the bobcat was using was noted. Eventually, frequency of use by bobcats in each cover type could be compared with the sampled types available in the study area. Four cover types were identified within the study area: sagebrush and grassland flats, badlands, creek bottoms, and stock reservoirs. Comparisons of use and availability were important in determining which prairie habitats were most important to bobcats. However, as I learned more about the habits of prairie bobcats, it became obvious that topography also played an important role in habitat use. Study animals consistently keyed in to the rougher terrain provided by the badland hills, although these areas offered little vegetative cover.

Use of open prairie sagebrush and grassland flats was low. Bobcats are vulnerable to potential predators in such open areas, and primary prey species are less abundant. Creek drainages were used more often, primarily as travel corridors through the sagebrush and grasslands to more rugged terrain. Stock reservoirs were used less, but most frequently in the spring because of high concentrations of prey at that time. Badland areas were used most extensively by bobcats during the study period because of the security cover they provided and abundant prey. These areas also provided excellent den sites.

One management objective of this study was to develop a

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Learning About the Outdoors IN the Outdoors

by Ursula Mattson

A tall man in buckskin stands at the front of the room holding a match to a mixture of dried prairie sage and sweet grass in a half-shell. "I want you to take all of your preconceived ideas and expectations of what this class will be, put them in a box, and set it aside. Don't destroy them. Leave them where you can collect them later, if you wish, but for now start with an open mind." A sweet smell fills the room as 14 people sit in silence with their private thoughts.

This is how Dr. Fred Donaldson begins his class, "People of the Mountain World" at the Glacier Institute. Preconceived notions of summer school often fall by the wayside as several hundred people attend classes at the Glacier Institute in Glacier National Park each summer. Explaining ecological concepts can be dull in a classroom, but these same ideas come alive while floating a river during "The North Fork Country." The life of a glacier can be diagrammed on a blackboard, but to

URSULA MATTSON

URSULA MATTSON

Over its four years of existence, the Glacier Institute has attracted people of all ages, occupations, and geographic backgrounds to its classes. Field trips, which vary from half-day strolls to rigorous backpacking forays, are at the heart of the Institute's educational concept.

URSULA MATTSON

LEX BLOOD

Classes like "People of the Mountain World," which delves into Blackfeet history and culture, and "Mountains, Valleys, and Glaciers," which explores the geological processes at work in Glacier National Park, provide invaluable outdoor experience for students at the Institute.

really understand a glacier, you need to walk on top of or crawl underneath it, as people in "Mountains, Valleys, and Glaciers" have done. Viewing slides in a darkened room of what bears eat is fine, but to go out and search for these plants in high meadows and marshy bottomlands is part of understanding the bear in "Glacier's Grizzlies." All classes include field trips; some are easy half-day strolls, while others are rigorous 12-mile forays.

It's this field experience—learning about the outdoors *in* the outdoors—that forms the framework for the Glacier Institute's existence. In fall 1983, Flathead area geologist Lex Blood and I, a biologist, began to talk about our vision of high-quality education in the Glacier ecosystem. We were joined by three local residents and the five of us became the organizational nucleus and first board of directors.

Glacier Park has always been used extensively by school groups from kindergarten through college levels, but this was the first organized attempt to offer an entire program of classes based in the park during the summer. Models for field institutes in western national parks included Yellowstone, Grand Teton, Yosemite, and a few others. Could Glacier have its own institute? The idea was presented and support solicited from the Glacier Natural History Association, Flathead Valley Community College (FVCC), and the National Park Service. All three groups responded quickly and enthusiastically by contributing start-up funds, staff time, transportation, and a facility. The institute opened in June 1984.

The first summer was a gamble. Those who had worked hard for nine months to put together a program watched with relief and excitement as one course after another did well. Nine classes met that summer. All were

accredited through FVCC and ranged from two to five days. The curriculum centered on the natural sciences but also offered art, photography, education, and history. Although there have been many changes and additions to the curriculum during the past four years, this pattern has remained the same.

Without people, the institute is nothing but a concept. From the volunteer board, to its small staff, on through a string of supporters in three cooperating groups, top-notch instructors, and—most important—those who take classes, the institute *is* people. At 83, retired Helena schoolteacher Eugenie McGregor came to the Glacier Institute in 1986: "I've been coming to Glacier Park for many years. When I was a young girl, my father brought me to Glacier before it was a national park. Then, in the late '20s, my husband and I had one of the first convertibles in Helena and we drove it over Going-to-the-Sun road before it was finished." She was still on the trails over 50 years later with the "Alpine Wildflowers" class.

Teachers form the single largest occupational group among institute participants. They can obtain recertification credits in a relatively short time in a fabulous environment. "As a teacher, I've been busy taking many courses this summer, and two- or three-day workshop courses are the easiest to get into," wrote one teacher at the end of a class. Most of those who took "People of the Mountain World" were teachers; they spent three days immersed in "the old ways" of Blackfeet history and culture. They worked porcupine quills and beads into patterns with their fingers and discovered these old crafts take a lot of patience and skill. In a meadow, they "stalked" each other and learned about tracking people and animals. Did they expect to do these things? The answer doesn't matter. All of their expectations were put away in an imaginary box. These were activities they could take back to classrooms and playgrounds to help make history more exciting.

Although teachers are the largest group, people from widely diverse backgrounds and occupations come to the institute. A retired British diplomat living in grizzly country wanted to learn more about bears; a TV producer came to Glacier for a sketching class; a special investigator for the U.S. Army brought his father from the East Coast to learn about glaciers. Retirees, homemakers, small business owners, nurses, bankers, and secretaries have come to Glacier Park to learn by their outdoor experiences. The list of occupations is long and varied, and the ages of participants have ranged from 7 to 83.

In its four years, the summer program has attracted people from 31 states and one Canadian province. People have come from as far as New England, the Southeast, and the Southwest, some of them spending their entire holiday taking classes. Enrolling for a week of classes can be a great vacation, considering you might spend it in alpine meadows delving into the names and lives of wildflowers or quickly becoming proficient with your camera so you don't miss that shot of a mountain goat staring at you from 20 feet above the trail. Two years ago, 15 graduate students from the University of West Virginia piled into vans and drove over 2,000 miles to take a five-day class on the geology and plants of Glacier.

What are the topics, and how do people decide what to take? Early each year, we send the summer program brochure to over 2,000 teachers, institute alumni, and others. Academic courses are the heart and soul of the program with college credit available from FVCC or the University of Montana. These two- to five-day classes cover topics from Glacier's life zones to the return of the wolf, from Glacier on foot to a roadside view of geology. Another option is one-day exploration classes open to individuals as well as families with children 10 and older. A different topic is offered each Saturday throughout summer.

With a threefold increase in the number of participants since its beginning in 1984, the growth of the institute program is rewarding. Yet, class size is limited to 15 for the sake of a quality experience. Small groups encourage student questions and involvement, while the outdoor classroom helps break down the distance between instructor and student that often pervades traditional classrooms.

This nontraditional approach applies to financing, administrative structure, and administrative workings of the institute as well. As an independent, nonprofit, educational corporation, the institute does not receive direct federal, state, or county funding. Student fees cover the largest share of costs. The three cooperating groups continue to contribute a variety of essential services. "It's a system that works well since each group has a vested interest in the program, yet no one group bears the entire fiscal responsibility," explains Dr. Blood, institute president.

The board of directors provides administrative momentum. Planning curriculum and budget, promoting the program, and setting policy are all part of monthly meetings. Directors volunteer their time and talent and serve for a minimum of two years. A commitment to outdoor education is their motivation, and success of the program is the only compensation.

Success can be measured by numbers, but more important is the response of those who share in the outdoor learning. One student captured the essence of the institute in just a few words: "I appreciate the work you each are doing here—to prove that learning is an adventure directly proportional to living life to the fullest. Thanks."

What about those preconceived ideas and expectations about the processes of teaching and learning relegated to the imaginary box? They creep into the edges of our imaginations when we anticipate what will happen next. But, if minds are open to absorb the unbelievable colors of a meadow in bloom, the feeling of movement and power within a glacier, the stories of the constellations, and even Dr. Donaldson in beaded buckskin and a coyote hat, those ideas can stay in that box. ■

* * * * *

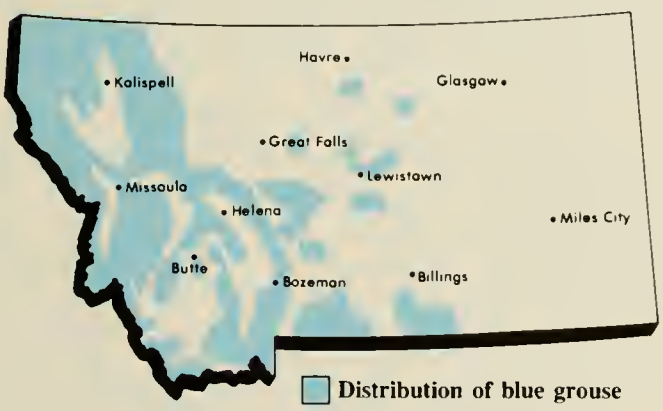
For more information about the Glacier Institute, contact: Year-round—Glacier Institute, P.O. Box 1457; Kalispell, MT 59903 (406/752-5222); June 15-Aug. 15—Glacier Institute, P.O. Box 527; West Glacier, MT 59936 (406/888-5215).

Are you restless after a long winter of inactivity? Are spring sunshine and cool breezes awakening a yearning for outdoor excitement? In early May, it is sometimes difficult to quell this fever because Montana rivers are high and roily from melting mountain snowpack, and high mountain parks and meadows, which offer such a splendid remedy for restlessness later, are still covered with waist-deep snow.

Might I suggest a remedy for these "springtime blues?" Go searching for springtime blues—blue grouse, that is—in the mountain foothills where snow has usually departed by mid-April. You can work the cramps and kinks out of your legs and possibly view a wildlife display that not too many people have seen. If this introduction has piqued your interest, here are the "where, when, and how."

Many creatures of mountain habitats migrate to lower foothills during fall and return to higher elevations in spring. Blue grouse do just the opposite. In late summer and early fall, they generally move to higher tree-covered ridges where they spend the winter eating conifer needles. When the days become longer and warmer in late March and early April, blue grouse begin moving back down to foothill areas where they begin their annual mating ritual. This is what you should search for: blue grouse breeding areas. Specifically, look for territorial male blue grouse in full mating display. As you can see from the accompanying photos, spring blues are a far cry from the somber, bluish-gray birds you see during summer and fall mountain treks.

Blue grouse inhabit most mountain ranges in Montana, from the Idaho border east to the Bear Paw and Little Rockies in the north, and south to the Big Snowy and Pryor mountains. However, they don't live in the Bull Mountains near Roundup or in the smaller mountain ranges of southeastern Montana such as the Long Pines, Wolf Mountains, and Chalk Buttes. If you live in the western two-thirds of the state, you are within reasonable driving distance of the springtime haunts of these unusual birds.



East of the Continental Divide and in the drier portions of southwestern Montana, blue grouse generally breed on lower mountain slopes and foothills near or at the lower margins of tree cover. Another likely spot for breeding habitat is lower elevation ridge lines and open south slopes with tree-covered north slopes. Long, narrow, isolated patches of conifers along low elevation drainage courses are also likely locations for breeding habitat. We know less about blue grouse breeding areas in the more heavily forested northwestern portions of the state, but blues probably breed there, in lower elevation grasslands at the edge of coniferous forests. In the Bitterroot region, they are often found near thickets of young conifers.

The best time to look for breeding blues is from mid-April to the end of May, with the peak breeding period about the first two weeks of May. They most often breed and display around sunrise and a few hours before sunset. However, during the first two weeks of May, males often display any time during the day, especially if females are nearby.

Once you have located a likely looking foothill habitat in which to conduct your search, walk quietly into the area, stopping occasionally to listen intently. Male blue grouse make three different kinds of sounds. The most common sound is the "hoot," a series of usually five evenly spaced notes perhaps more accurately described as "grunts." This sound originates from the male's air sacs and is on the low end of sounds that can be heard by humans. In the subspecies of blue grouse found in Montana, this sound can be heard from 50 to 100 yards away on a still day. This sound is hard to describe, but it goes something like this—"ump, ump, ump, ump, ump," becoming softer toward the last syllable.

Another vocalization to listen for is the "precopulatory hoot," a single syllable emanating from the air sac. The sound is similar to that made by blowing over the open end of a pop bottle—"whoot." The male emits it when he spots a female nearby; he then rushes toward her with his wing tips dragging on the ground. It is heard most during the peak of the breeding

The blue grouse of spring is a far cry from the somber bird of summer (photo: Tom Nelson).

season; on calm days, it carries for perhaps a mile.

Besides these vocal sounds, territorial males also make a "flutter jump" or "wing clap" sound, a short, rapid, usually two-syllable wing beat made when females are near or in response to a "flutter jump" from another male. In fact, it can be used to locate other males. If you encounter a female blue or a male that isn't displaying and are anxious to find more action, flush the bird that is nearby. When it lands, it will usually do so with a short, loud flutter. Any nearby males will usually respond with a "flutter jump" of their own, so you will have a good idea of where to look for them.

Once you have located a male, sit quietly and observe him as long as your patience holds. If you are lucky and the timing is right, you will view him in complete courtship display. Watch his air sacs expand and contract as he hoots. Look closely at his "eye combs," skinlike appendages above the eyes that swell with blood. As the intensity of his mood changes, you may be able to watch the eye combs change from brilliant yellow to crimson red. As he proudly and defiantly struts, note how he cocks his head and neck to one side so that the white rosette of feathers around the reddish air sac is framed by his dark, widely fanned, and erectly held tail.

I once encountered an elderly gentleman in the hills who had recently witnessed such a display. He inquired if I had seen any of those little "mountain turkeys" and proceeded to describe the exotic display of a territorial male blue grouse. In many ways, their display with tail widely fanned duplicates that of a tom turkey.

If you have located a male blue and he hasn't provided you with the type of display I have described or if he is somewhat bashful and retiring, look around. There should be other males nearby. Male blues are like people—they have individual personalities. Some like to brag and show their stuff in front of the world, and others are more bashful and discreet.

Male blue grouse are territorial and have a high fidelity for their chosen territory. During the breeding season, they normally stay within and defend from other males a two- to three-acre area. They return to this same area year after year until they end up in blue grouse heaven—or in some lucky hunter's oven.

That's my recipe for finding and curing springtime blues. Don't forget to bring your camera and binoculars because Montana's mountain foothills are full of springtime surprises and delights. ■

Orange eye combs swollen, red air sac displayed against a white rosette of feathers, and tail fanned, an amorous male blue grouse surveys his domain.

DON JONES

Shikar-Safari Honors Two Wardens

Two Montana game wardens received prestigious Shikar-Safari Club "Wildlife Officer of the Year" awards at a formal presentation at the Montana Fish and Game Commission meeting in November. Jim Kropp, Great Falls warden, was selected as the Wildlife Officer of the Year for 1987, and Gary Benson, Havre, received the award for 1986.

The award is usually presented each year, but because of a scheduling difficulty, the club chose to simultaneously present the '86 and '87 awards at the November commission meeting.

Benson, a nine-year veteran of the Montana Department of Fish, Wildlife and Parks (DFWP) Enforcement Division, began his career in the Glasgow region and has been the Havre district warden since 1980. While in Havre, he has been active in the state's hunter safety education program. He assisted the Hill County Sheriff's Department in its crime prevention program, and became a member of the Bear Paw First Responders Unit. He has also worked to foster better relations with the U.S. Border Patrol and coordinated various training activities between the DFWP and border patrol staff. In addition, he is a frequent speaker at local high schools and Northern Montana College, and at meetings of sportsmen clubs, 4-H clubs, Boy Scouts, and the Montana Stockgrowers Association.

Kropp began his warden career in Billings in 1980, but was transferred to Great Falls in 1981. He directed successful investigations that resulted in convictions in three separate incidents involving illegal killing of elk. Enforcement Division Administrator Erv Kent said Kropp's water safety efforts have resulted in safer boating and better compliance with regulations on the Missouri River. Kent said Kropp has attained similar results for snowmobile safety and regulation compliance in the Kings Hill area of the Little Belt Mountains.

The Shikar-Safari Club winner is chosen by the DFWP director from nominations submitted from each of the department's seven administrative regions. Winners are selected on the basis of their professional relationship with sportsmen and landowners in their region, as well as their participation in activities outside of usual duties. The award has been presented since 1969.

TOM WARREN

Wardens Gary Benson (left) and Jim Kropp

Watch Wildlife Films In April

Missoula is the site of the largest and longest running film festival of its kind in the world. The 11th annual International Wildlife Film Festival opens April 4 and runs through the 10th.

The annual competition and showing also features a wide range of related events, such as workshops, speakers, panels, and other programs designed to improve the quality of wildlife films. Events under consideration for 1988 include a wildlife photo contest; workshops and panels on children's films, conservation groups and wildlife films, and wildlife in the news; and many others.

For additional information, contact the International Wildlife Film Festival, University of Montana; Missoula, MT 59812, or call Charles Jonkel or Norm Bourg at 406/243-4493 or 406/728-0345.

Fishing Regs: Colorful, Convenient

From the colorful action depicted on the cover to details about individual fishing districts, the 1988-90 fishing regulations booklet is bright and better than ever. Color and convenience mark the full-color publication. Montana's Centennial is highlighted by inclusion of a removable center section which lists significant events in the department's history.

Color also makes maps easier to interpret. The popular 4-1/4 x 9-1/2 format (just right to fit into your tackle box), used for the first time in the 1986-88 edition, is retained. Headings in bold type make it easier to locate information about specific sections.

The booklet includes details about general fishing license requirements and fees, how to release fish, use of the "Fisherman's Log," what you should

do if you catch a fish with a numbered tag, and much more. The fish identification guide contains brilliant illustrations of fish found in warm and cold waters across Montana.

Pick up your copy at license agents, regional DFWP offices, or at the Helena headquarters.

Beyond Wild Turkeys

With the death of Bill Gearhart of Pompey's Pillar last August, the Department of Fish, Wildlife and Parks lost one of its most valuable and longtime cooperators.

Bill often jokingly commented that his ranch produced nothing but wild turkeys. And it certainly *did* produce wild turkeys: During the last 15 years, 593 birds were trapped and transplanted by the DFWP, in addition to turkeys taken by hunters on the ranch. The trapping and transplanting made possible the introduction of wild turkeys into 26 additional areas in Montana, many of which enjoy thriving turkey populations today.

Bill went above and beyond the usual role of a cooperator. He helped with trapping by baiting and handling the birds, and even occasionally providing transportation. He saved the DFWP trapping time by tending the traps and making the necessary phone calls when birds were ready to be trapped. Once, he even fired the trap and loaded the birds before he called. By the time trappers arrived, the birds were in the trailer, ready to be moved.

Bill and his family provided the bunkhouse and special good-natured hospitality at the ranch. It seems that wild turkey-trapping weather is always cold and miserable, and the Gearharts offered the warmth of their home, hot coffee, occasional warm meals, and always their friendship.

Bill Gearhart made a great contribution to the wild turkey management of this state.—*Bob Greene (retired), Warm Springs Game Farm*

BOOK REVIEWS

A WILDERNESS ORIGINAL: The Life of Bob Marshall, by James M. Glover, The Mountaineers, Seattle, WA 98119; 1986, 323 pages, 34 photos (black and white), $17.95, hard cover.

In "A Wilderness Original: The Life of Bob Marshall," author James Glover chronicles the too-brief personal and professional life (1901-1939) of Bob Marshall, one of our greatest conservationists and wilderness advocates. Glover enlisted the help of Marshall's two surviving brothers, and seemingly everyone else who knew Bob Marshall, to produce an unusually penetrating portrait of a man some called "the holy guru to the wilderness people." The book is meticulously documented, including 682 notes and references to nearly every article and book Marshall wrote. Not only does the book include a thorough and entertaining coverage of Marshall's life, it also acts as a useful reference for background on the wilderness movement and the evolution of forest and National Park policy in this country.

In "A Wilderness Original," the author skillfully traces Marshall's personal traits, upbringing, and experiences, and shows how these influenced his attitudes as a forester, wilderness activist, and champion of liberal causes. Marshall emerges as a compelling figure; an energetic, likable, intelligent man; an explorer with unbounded enthusiasm. Although born to a wealthy New York family (his father was a well-known constitutional lawyer), Marshall shunned personal possessions and pretense. He spent his first 18 summers at Knollwood, a family summer camp in the Adirondacks where he developed a passion for wilderness and nature and a distrust for civilization. This interest in the outdoors led him to seek M.S. and Ph.D. degrees in forestry and plant physiology.

Of course, Marshall's lifelong work and greatest interest was wilderness preservation. In his positions with the U.S. Forest Service and Bureau of Indian Affairs in Montana, Washington, and Washington, D.C., he was as important as anyone in influencing public opinion and forest policy toward preservation of the wildlands remaining in the United States in the 1930s. His energy in both personal and professional life was legendary. He often walked 30 to 40 miles in a single day through mountainous terrain; he was a prolific author of books and articles, and a persistent political activist. He was fired by belief in the practical and aesthetic value of wilderness. Once, when asked how much wilderness was needed, he replied, "How many Brahms symphonies do we need?"

In the book, Glover describes how Marshall, along with seven others (including Aldo Leopold), bucked accepted forest policy and formed The Wilderness Society. He describes the fight waged by Marshall and others to keep roads out of proposed wilderness areas, and Marshall's efforts to nationalize and preserve the country's forests. In some of the more interesting chapters, Glover draws on Marshall's books, "Arctic Village" and "The Alaska Wilderness," to report on Marshall's explorations of the Brooks Range of Alaska and

his efforts to educate others about the merits of keeping Alaska a wilderness.

Although Marshall died inexplicably at 38 while riding on a train from Washington, D.C., to New York (in the final chapter, Glover explores possible causes for his death), his influence can be seen in nearly every wilderness issue. In his will, Marshall specified a portion of his estate for the preservation of wilderness. The "Robert Marshall Wilderness Fund," administered by The Wilderness Society, helped support efforts to pass the Wilderness Act of 1964 and to promote the Alaska National Interest Lands Conservation Act. In 1940, the Bob Marshall Wilderness Area was established in western Montana, honoring Marshall and making his name a household word among wilderness users.

"A Wilderness Original" is a should-read book for those involved or interested in natural resource issues. In the end, one identifies with the unflappable Marshall and derives inspiration from his energy, resolve, and ability to influence national resource policy both from inside and outside government. In an often frustrating arena where preservation of the natural landscape must compete with political and economic interests, it is important that Glover has illustrated how the efforts of one person can make a difference.—*John Fraley, special projects manager, Fisheries Division, Kalispell*

ARCTIC DREAMS—Imagination and Desire in a Northern Landscape, by Barry Holstun Lopez, Charles Scribner's Sons, New York; 1986, 464 pages, $22.95 hard cover, $4.95 soft cover.

You don't have to be a geographer, a biologist, or an historian to enjoy the latest book by the award-winning author of "Of Wolves and Men."

Though not with definite sections or boundaries, this book is really three treatises. The first is Lopez' enchanting observation of Arctic animal life. My imagination was particularly captivated by his discussion of the narwhals, small whales which may measure 16 feet long. The male bears a single ivory tusk. Lopez describes his wonderment when he first saw narwhals: "The day I saw them I knew that no element of the earth's natural history had ever before brought me so far so suddenly. It was as though something from a bestiary had taken shape, a creature strange as a giraffe.

The second treatise reveals a part of the world seldom heard of or seen. Lopez describes islands, straits, land masses, and seas with the care of one who has walked the lands himself. While observing musk oxen near the Thomsen River on Banks Island, he describes the scenery with poetic clarity: "Tundra melt ponds, their bright dark blue waters oblique to the sun, stand out boldly in the plain. In the center of the large ponds, beneath the surface of the water, gleam cores of aquamarine ice, like the constricted heart of winter."

The history of Arctic exploration is the third treatise. Here it is revealed that the names given to the lands and waters were not bestowed lightly. Unspeakable hardships—even death—were routine "reward" for those in pursuit of the Northwest Passage. Those sacrifices are honored in naming the land's features—Banks, Baffin, Devon islands; Barrow, Davis, McClure straits; peninsulas named for Hall, Foxe, or Melville.

Lopez writes in a poetic, almost musical, manner. He can turn from describing an iceberg ("The ice reflected the light and trapped it within its crystalline corners and edges, where it intensified.") to descriptions of Arctic bird life as light and lilting as the kittiwakes, northern fulmars, and black guillemots described.

Lopez' compassionate understanding of the Arctic's few inhabitants is revealed in deep, respectful expressions linking the people with the land of lingering twilight.

It is a satisfying book—nurturing, sustaining, and educational. Its beauty and wisdom linger long after the final page is turned and the book is closed.—*Gretchen Olheiser, chief, Project and Planning Bureau, Parks Division, Helena*

Prairie 'Cat *continued from page 4*

method for determining trends in bobcat populations. A series of scent post transect lines, comprised of scent stations spaced at regular intervals, was established and monitored to check bobcat visitation rates. With such a system, biologists can determine if a bobcat population is increasing, remaining relatively stable, or decreasing, by comparing the number of visits from year to year. In conjunction with the bobcat population trend monitoring, evening headlight surveys of rabbits were conducted to see if changes in prey numbers corresponded with changes in bobcat numbers.

During the study, bobcats visited the scent post stations, providing baseline data with which future surveys can be compared. Over time, visitation will be used to determine population trends. Along with the rabbit counts, any indication of population changes will allow managers to estimate or project population densities in the study area before setting seasons and adjusting harvest limits.

This study of southeastern Montana's prairie bobcats will assist the DFWP in achieving future bobcat management goals. The DFWP now has a much clearer picture of bobcat population densities, home range size, movements, and habitat use in the prairie rangeland environment, and can begin to monitor fluctuating populations and adjust harvest regulations.

Montana's bobcat management program has developed with the goal of maintaining a healthy population of bobcats throughout the state while allowing a sustained annual harvest. This has been accomplished with harvest restrictions, such as limited season lengths, regional quotas, and district limits. Before 1977, an unregulated harvest and rising pelt prices contributed to an overall population decline and decreasing harvest. Fortunately for the bobcat, however, reclassification and implementation of the DFWP's current management program allowed Montana's bobcat population to recover. An increased harvest, to levels of the early 1970s, corresponded with this recovery. The tagging and registration program will continue to provide information to assess harvest levels, distribution, habitat utilization, and population density trends. Ongoing research will continue to contribute information to fine tune management objectives by providing answers to specific management questions, such as density estimates and habitat utilization.

With continued research and active management of the species, the future of Montana's prairie bobcats is a bright one.■

CONTRIBUTORS

• One could call **Brian Giddings** a "bobcat authority." He worked on a five-year bobcat/ecology study in western Montana from 1980-82. Research for the article in this issue was conducted for his master's degree at Montana State University, and he conducted his field work on the southeastern Montana prairie north of Miles City. So when he tells you that the bobcat thrives on the eastern Montana prairie, you'll know it's not just opinion. Turn to "Prairie 'Cat" on page 2. Giddings is a research assistant in the Kalispell office of the Department of Fish, Wildlife and Parks. He has been with DFWP since 1980.

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• Glacier National Park provides a splendid classroom for "Learning About the Outdoors IN the Outdoors." No matter if you're 7 or 83, no matter if you can walk half a mile or 15, no matter if you like wildflowers or grizzly bears—the Glacier Institute has something for you. Turn to **Ursula Mattson's** article on page 5. She was a member of the institute's first board of directors and continues as its program director. She also teaches a class in endangered species for the Wildlands Research Institute at San Francisco State University.

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• Even though there might not be a cure for the summertime blues, **Bob Martinka** believes there sure is one for the "Springtime Blues." Get the winter kinks out by roaming the mountain foothills in search of blue grouse. As Martinka notes, spring blues are a far cry from the somber, bluish-gray birds one sees during summer and fall mountain treks. The photos accompanying his article, beginning on page 8, back him up. Martinka is resource program manager in the department's resource assessment unit.

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• **Mike Aderhold's** forte is taking a complex, multifaceted issue and turning it into something complete, but readable; thought-provoking, accurate. That's what he's done with "Montana's Rare Ones," a look at Montana's eight threatened or endangered species. Aderhold notes that his summary came from information in the department's files, and from reports of the International Crane Foundation, the Montana Bald Eagle Working Group, the Montana Piping Plover Recovery Committee, the National Audubon Society, the National Wildlife Federation, The Peregrine, Fund, Inc., the Wolf Ecology Project, and personal discussions with the following biologists and administrators: Dave Belitsky and Larry Kruckenberg, Wyoming Game and Fish Department; Wayne Brewster, Ron Crete, Craig Faanes, Rob Hazelwood, Wally Jobman, Chris Servheen, Gene Stroops, and Jim Stutzman, U.S. Fish and Wildlife Service; Jim Cross, Arnold Dood, Glenn Erickson, and Wayne Kasworm, Montana Department of Fish, Wildlife and Parks; Mike Fairchild and Robert Ream, University of Montana; Riley McClelland, UM and National Park Service; and Dwain Prellwitz, Bureau of Land Management. Aderhold continues as the department's information officer in Kalispell; his article begins on page 15.

* * * * *

• The pen & ink illustrations of the rare ones were done by **Diana Haker**, a Worden artist. Her work has appeared previously in *Montana Outdoors*, as well as in *Safari, Bugle, Fins and Feathers, Western Outdoors, Bowhunter Magazine*, and High Country News. She is working on a series of elk prints for the Rocky Mountain Elk Foundation and a series featuring bighorn sheep, mule deer, grizzly bears, and elk for the Rocky Mountain Hunting and Fishing Club. Her work is available at many galleries throughout Montana; for additional information, contact her at P.O. Box 14; Worden, MT 59088 (406/967-2727).

* * * * *

• **Bill Ciesla** is a hiker, camper, fisherman, hunter, and skier who has been entertained often by the "Whiskey Jack." The gray jay—a.k.a. Canada jay or "camp robber"—is at home in Montana in lodgepole pine country. As he writes, "Whiskey jacks are best described as bold, brazen mooches, and tales of their antics date to the first mining camps in the Rockies...." Ciesla is a forest entomologist who has worked with the U.S. Forest Service for many years. A former Montanan, he lives in Fort Collins, Colo., where he is also a free-lance writer and photographer. His articles and photos have appeared in many publications, including *American Forests, Colorado Country Life*, and *Montana Magazine*. His contribution to our issue begins on page 30.

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• *Montana Outdoors* continues its "Perspectives" series on page 32 with "The Mind of the Fisherman" by **John Seidensticker**. John's father was the sort who always wanted to "go fishing." For years, fishing accouterments were the substance of birthday and Christmas gifts. In fact, prospective girlfriends were even queried about their interest in fishing, and further interest in them was directly related to the response. The difficulty was that John wasn't particularly interested in fishing; he opted to watch birds. But, as sons grow older, the ability to understand fathers deepens. Exposure to other cultures made John realize that bringing fish home was never what his father's notion of being a fisherman was all about. John grew up in Dillon and still tries to return once a year to enjoy the country; he is a curator at the National Zoological Park, Smithsonian Institution, in Washington, D.C.

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• Illustration for "The Mind of the Fisherman" was prepared by Helena artist **Shirley Cleary**. Well-known for her "fishing" illustrations, her work has appeared often in *MO*. She accepts commissions to do paintings of people fishing on Montana streams. She was added to the prestigious "Who's Who in American Art" listing in 1987, and she has been featured in *The Artists* magazine. Her work, including limited edition prints, is available at galleries throughout the United States. For more information, contact her at 1804 Belt View; Helena, MT 59601 (406/443-4535).

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• *MO* wishes to thank **Jan Bonham Metzmaker**, Whitefish, whose sketch of a bald eagle accompanies "Nongame News." Her work has occasionally appeared in our pages, and we're grateful for her continuing support. Thanks also to **Don Jones**, Troy; **Kathryn Meade**, Great Falls; and **Tom Nelson**, Gardiner.

Montana has eight animals classified as either "endangered" or "threatened."

MONTANA'S RARE ONES

"First Snow—Grizzly," © 1983 John Seerey-Lester. Courtesy of the artist and Mill Pond Press, Inc.; Venice, FL 34292.

by Mike Aderhold
pen & ink illustrations by Diana Haker

In 1912, William Hornaday, then director of the New York Zoological Park, wrote to several Montanans asking about wildlife that had become extinct or was threatened with extinction. In his book, "Our Vanishing Wildlife" (1913), the Montana section noted that many birds were on the verge of extinction, but the only animals that had vanished from the wild were the bison, passenger pigeon, and whooping crane. Threatened animals included the blue grouse, sage grouse, Columbian sharp-tailed grouse, trumpeter swan, most waterfowl, long-billed curlew, white-tailed ptarmigan, plover, grizzly bear, and moose. The state had fewer than 3,000 elk and 3,000 antelope and very few deer in eastern Montana.

Early Montana legislation included year-round closed seasons for moose and elk (1893); prohibition of the sale of game animals (1897); creation of a state wildlife agency (1901); required hunting and fishing licenses, with revenue earmarked for wildlife protection (1905); and the creation of game preserves (Snow Creek, Pryor Mountain, and Gallatin, 1911; Sun River, 1913). Each step added a plank to Montana's conservation platform. These early measures came together as a basic state wildlife policy in the 1930s.

In 1972, the International Association of Game, Fish and Conservation Commissioners and The Wildlife Society devel-

oped a model state nongame and endangered species law. The 1973 Montana Legislature passed it, effective July 1, 1973. This new law gave the Montana Department of Fish, Wildlife and Parks (DFWP) the responsibility to conserve resident species of endangered and threatened wildlife. The Legislature also granted authority to the DFWP to conduct nongame and endangered species research, acquire habitat for their use, and develop management programs for these species.

In fall 1973, biologist Dennis Flath took charge of the program. Originally, funds for this position came entirely from fishing and hunting license fees. Today, it is supported by a state income tax checkoff, other private donations, federal funds, and license revenue. Flath's original assignment was: (1) to promote public understanding and appreciation of nongame and endangered species, (2) to determine species in need of special management, (3) to participate in recovery planning and implementation of those plans for endangered species, and (4) to research essential habitat needs.

In 1985, federal funds enabled the DFWP to hire a second biologist. Arnold Dood was assigned responsibility for Montana's endangered species program, while Flath remained in charge of the nongame program and bald eagle coordination.

ENDANGERED SPECIES ACTS

Until the 1960s, no comprehensive federal program or central guidance existed in the effort to protect rare animals. At that time, a wave of environmental awareness swept the nation. This awareness grew from a popular realization that natural resources were limited and that many aspects of natural resource development were connected.

A long debate arose concerning the role of the federal government in protecting rare animals, especially those threatened by human activities. The first result was the Endangered Species Preservation Act of 1966.

The new law directed the heads of all federal agencies in the Departments of Interior, Agriculture, and Defense to protect native forms of wildlife declared "endangered." It authorized expenditure of funds to acquire habitat for these animals, and it required the Secretary of the Interior to identify jeopardized species and to list them. It also directed the secretary to cooperate with states to the "maximum extent practicable."

The law, as innovative as it was, had several limitations. It lacked enforcement authority and placed no restriction on taking of, or interstate commerce in, endangered animals. The 1966 law assumed that existing state laws adequately protected declining species. Last, the measure was limited to "native fish and wildlife."

In 1969, Congress replaced the 1966 act with the Endangered Species Conservation Act. Pressure for this revised legislation was fueled by allegations that about 1,000 poachers were killing alligators in southern Florida despite a state law banning the practice. The law expanded the definition of "fish and wildlife" to include reptiles, amphibians, mollusks, and crustaceans. It prohibited interstate commerce in endangered species. It expanded the list to include animals threatened with worldwide extinction and strengthened laws limiting importation of such animals into the United States.

The 1969 law was most noteworthy because it directed the Secretaries of the Interior and State to convene a meeting to develop binding international rules on the conservation of endangered species. The 1973 Convention on International Trade in Endangered Species (CITES) of wild fauna and flora resulted, and this treaty now regulates trade in wildlife among the 89 nations which signed it.

That same year, Congress passed an even more comprehensive law, the Endangered Species Act of 1973. This is the basic legal authority for the present federal endangered species program. So strong was the feeling on this issue that the Senate vote was unanimous, 92-0; in the House, the vote was 355-4.

The 1973 act expanded the definition of eligible wildlife to include "any member of the animal kingdom," and it expanded the principle of "species" to include distinct "geographic populations." It also recognized degrees of vulnerability and protection by establishing two categories: "endangered" and "threatened."

"Endangered" species are those determined to be in danger of extinction throughout all, or a significant portion, of their range; "threatened" species are likely to become "endangered" within the foreseeable future.

The Endangered Species Act of 1973 formalized the listing and delisting procedure, required development of specific plans of action for recovery of listed species, increased criminal penalties, added funds for habitat acquisition, and encouraged and assisted state conservation efforts.

Montana's threatened and endangered species fall under jurisdiction of this law and the Department of the Interior. Wildlife duties of the Secretary of the Interior have been delegated to the U.S. Fish and Wildlife Service (USFWS), the federal wildlife agency, and within that agency to the Office of Endangered Species. This office coordinates the federal endangered species program. The USFWS maintains an endangered species office in Helena, Mont., and this unit oversees the federal program in Montana and Wyoming.

Nationally, the USFWS' endangered species effort involves between 400 and 500 full- and part-time employees. It received an appropriation of a little over $39 million in 1987, with the money divided among six major functions: listing, law enforcement, consultation, recovery, research, and state grants.

Consultation is one of the most important functions in the federal program. The USFWS works with other federal agencies to ensure that their programs do not jeopardize "threatened" and "endangered" species. The goal is to minimize, prevent, or at least influence actions that might otherwise alter or destroy valuable wildlife habitat.

Two recent developments have improved this consultation requirement. Most federal land agencies now have in-house biologists, and their planning efforts often help avoid endangered species problems. Second, the USFWS does more and more informal consulting. This does not require a formal "biological opinion," but influences planning and helps avoid

costly, last-minute delays of projects (so-called "jeopardy decisions") and expensive litigation. Since 1979, the USFWS has carried out more than 20,000 informal consultations and more than 2,600 formal consultations. Fewer than 300 cases resulted in a "jeopardy" opinion denying a proposal. Few federal programs now become involved in the controversial Tellico Dam/snail darter sort of litigation that gave the Endangered Species Act such a bad reputation in the mid-1970s.

The bitter, confrontational endangered species politics of the 1970s is becoming a thing of the past. It may have just been an outgrowth of new and untried legislation. But the law is still abused from both directions. Valuable habitat is still shamelessly ruined for short-term gain, and the act is still used as a wrench to jam the gears of reasonable, well-planned developments.

REAUTHORIZATION

The Endangered Species Act of 1973 has been reviewed, refined, and reauthorized by Congress every three or four years. The last adjustment was made in 1982 for the three years into 1985. The reauthorization beyond that date has been hotly debated in at least eight congressional hearings. Congress has taken a "good bill or no bill" attitude and, in the absence of a decision, has continued annual appropriations at the 1985 level ($39.25 million).

On Dec. 17, 1987, the House of Representatives finally passed its reauthorization bill (HR1467) by a vote of 399-16. A similar bill in the Senate (S675) is out of committee and at printing time was awaiting a full Senate vote.

The House bill reauthorized the Endangered Species Act through fiscal 1992. It raises the funding level to $61 million in fiscal 1990, speeds the listing process, increases penalties, and increases state grants.

THE STATUS OF MONTANA'S ENDANGERED OR THREATENED SPECIES

Montana has eight animals classified as either endangered or threatened. The Montana list contains four "endangered" species: the American race of the peregrine falcon (*Falco peregrinus anatum*); the whooping crane (*Grus americana*); the northern Rocky Mountain race of the gray wolf (currently identified as *Canis lupus irremotus*, although taxonomy of the various races of the gray wolf is under question); and the black-footed ferret (*Mustela nigripes*).

The federal list of endangered or threatened species includes these, plus four others: The American bald eagle (*Haliaeetus leucocephalus*) and the interior population of the least tern (*Sterna antillarum*) are listed as "endangered"; the continental U.S. population of the grizzly bear (*Ursus arctos horribilis*) and the northern Great Plains population of the piping plover (*Charadrius melodus*) are classified as "threatened."

All eight are protected by state and federal law; in general, it is unlawful for an individual to take, possess, transport, or sell these species. Exceptions are research and the limited hunting of grizzly bears.

Our knowledge and understanding of these rare animals constantly grows and changes. What follows is a summary of information available at the beginning of 1988.

BLACK-FOOTED FERRET (*Mustela nigripes*)

Rarest of the planet's 21 weasels and polecats, this nocturnal, yellowish, mink-sized predator has a dark facial mask and black-tipped tail and feet. The black-footed ferret also may be the rarest mammal in the world. At the end of 1987, only 25 were known to exist and all were part of a captive breeding population at the Wyoming Game and Fish Department's Sybille Wildlife Research Unit north of Laramie.

The black-footed ferret was first described by naturalists John Audubon and John Backman from an imperfect skin sent to them from Fort Laramie, Wyo., in 1851. In 1929, naturalist Ernest Thompson Seton found such a meager number of sightings that he concluded the animal had always been rare. Only about 1,000 reports of live black-footed ferrets have ever been documented.

Historical distribution of this animal probably coincided with the range of blacktail, whitetail, and Gunnison's prairie

Black-Footed Ferret

dogs. Their range 120 years ago was spread over at least 200,000 square miles of 12 prairie states, two Canadian provinces, and into northern Mexico. *Mustela nigripes* relies almost entirely on prairie dogs for food and shelter, so it's not surprising its near extinction has been tied to a century of prairie dog control, and to introduced diseases. The black-footed ferret was placed on the first federal endangered species list in 1964.

In Montana, 39 black-footed ferret specimens have been documented from 15 counties, all east of the Continental Divide. The last documentation of a live black-footed ferret in Montana was made on Sept. 13, 1977, on a ranch in Carter County near Ekalaka. A later search in this area failed to turn up other ferrets.

Within a year of this 1977 sighting, the last of nine captive ferrets from South Dakota died at the USFWS Patuxent Wildlife Research Center near Washington, D.C. No wild black-footed ferrets were documented between 1972 and 1981, and many believed the species had become extinct.

On Sept. 26, 1981, a ranch dog killed a black-footed ferret near the northwestern Wyoming town of Meeteetse. In the surrounding area of about 150 square miles, 21 whitetail prairie dog towns were found, all with ferrets. In spring of 1982, observers saw 12 litters and 38 young. In summer 1983, observers noted 88 ferrets, 18 litters, and 60 kits. In 1984, the Meeteetse ferret count had reached 129, and the population appeared secure.

BLACK-FOOTED FERRET

★ **Last live b-f ferret seen Sept. 13, 1977**

• **Top three reintroduction sites**

☐ **Historic range**

Researchers expected the population to continue to grow in 1985, but instead surveys showed a drop—60 in August, 31 in October, and fewer than a dozen in December. Sylvatic plague was discovered in the prairie dogs, and canine distemper was affecting the ferrets. Officials decided to trap some of the survivors and try captive breeding.

In fall 1985, six carefully selected ferrets were captured and moved to Wyoming's research facility. By January 1986, all six had died of canine distemper. Six more were trapped, two juvenile males and four females. The ferret quarters were carefully disinfected and the animals quarantined. They survived, but did not successfully breed in 1986.

In August 1986, officials decided to capture all of the remaining ferrets near Meeteetse. By the end of February 1987, the captive population was at 18, and no ferrets were known to exist in the wild. On June 6, 1987, one litter of six was born; 23 days later a second litter of two was produced. One of the eight kits died, leaving five females and two males.

At the beginning of 1988, the 18 adults and seven young were all in good condition. The Wyoming department plans to build two separate populations to 20 breeding ferrets each and then create a third breeding group. These groups will be geographically separated to protect against spread of disease or other natural disasters. All three captive groups will be managed as a single genetic population until 200 breeding ferrets (about 500 total animals) have been produced. At that time, researchers will attempt reintroductions back to the wild (recent ferret articles in *Montana Outdoors* appeared in May/June 1984 and July/August 1987).

For the last four years, the DFWP has contracted its ferret work to a consulting group, BIOTA. The original plan included inventorying Montana's prairie dog resources, creating maps showing where prairie dogs exist, and evaluating and ranking the best sites for reintroduction from Wyoming's population. The top three ferret reintroduction sites in Montana are on the Fort Belknap Reservation, in south Phillips County, and on the Charles M. Russell National Wildlife Refuge (NWR).

Emphasis changed in 1986 to simply finding more ferrets. As incentive, a reward program was set up, funded by Wildlife Conservation International, a division of the New York Zoological Society. The group will pay $5,000 to anyone who provides a photograph or information which results in verification of one or more live black-footed ferrets in Montana.

Recently, the Montana Fish and Game Commission authorized a plan to assist Wyoming's captive breeding program if and when any ferrets are found. In the last eight months, researchers have checked 15 ferret reports and surveyed 6,000 acres in north central Montana, looking for ferrets.

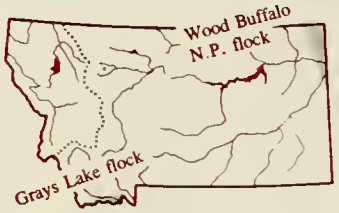
WHOOPING CRANE (*Grus americana*)

Of the 15 species of cranes in the world, seven are endangered. The rarest is the whooping crane.

The whooping crane is the largest (up to 16 pounds) wading bird in the United States. It is the tallest bird in North America (up to five feet), and it has a huge wingspan (about seven feet). The adult's plumage is snowy white with black wing tips and dark gray legs and feet.

As a group, cranes are the oldest living birds. The fossil record places their ancestors in the Eocene epoch, 40 million years ago. Sandhill crane fossils have been found in Pliocene deposits considered 9 million years old. Whoopers were believed most abundant during the Pleistocene Ice Ages, 200,000 to 1 million years ago.

In 1941, only 21 whoopers were known to exist. Human disturbance of nesting and wintering habitat is thought to have been responsible for this highly specialized and sensitive



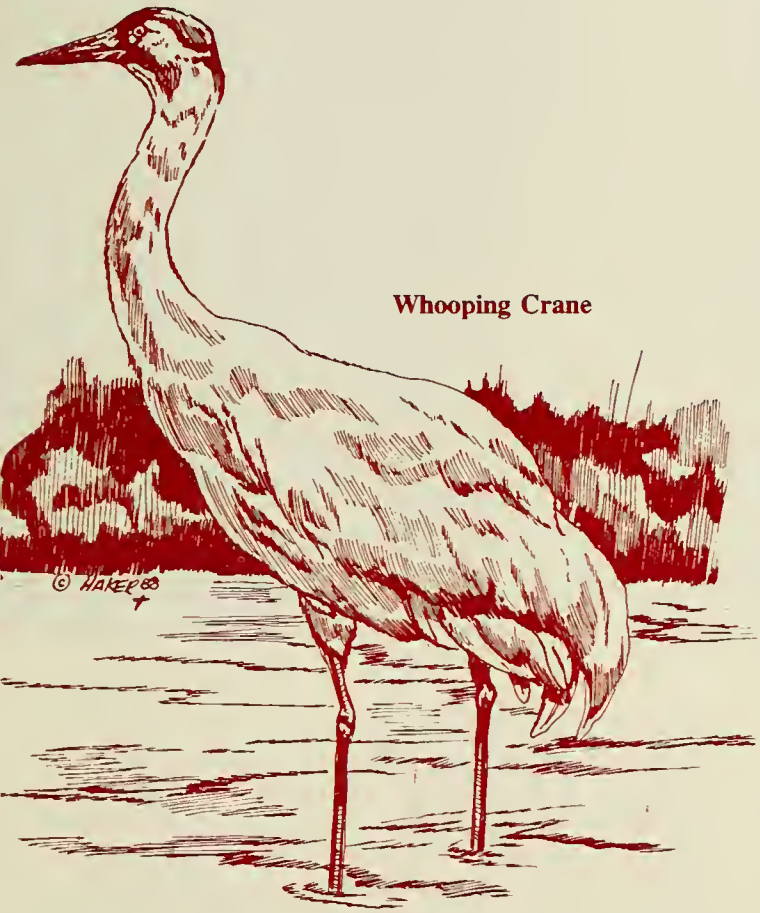
WHOOPING CRANE

☐ **Location of most of the whooping crane observations in Montana**

bird's decline (*Montana Outdoors*, March/April 1980).

Today, only two small groups exist in the wild. One flock nests in the northern part of the 17,300-square-mile Wood Buffalo National Park in Canada's Northwest Territories. In fall, these birds migrate 2,600 miles south to wintering grounds along the Texas Gulf Coast near the 47,200-acre Aransas NWR. This is the last of several nesting groups active in the early 1900s. In 1941, the migrating Wood Buffalo/Aransas population numbered only 16.

In the wild, whoopers generally lay two eggs, but sibling rivalry is such that only one chick usually survives. In 1975, 14 "surplus eggs" from the Wood Buffalo flock were put



Whooping Crane

under nesting sandhill cranes at Grays Lake NWR in southeastern Idaho. This cross-fostering work has continued and produced a second flock that winters on and near Bosque del Apache National Wildlife Refuge in central New Mexico.

In 1984, 13 whoopers fledged at Grays Lake, bringing this "experimental flock" to a record 35. But drought and high mortality the last three years has reduced this population to around 20. After 12 years, this flock has yet to produce its own young. Part of the problem is a high degree of dispersal when the birds return north each spring.

In spring 1987, 109 whoopers flew north from Aransas. In a record 32 nesting attempts, they produced 25 young. This was the fourth year in a row that a record number of young had been produced in Canada (1984—15, 1985—16, 1986—20). The count on the wintering grounds at Christmastime was 132—the highest since annual surveys were initiated in 1938.

In addition to the birds at Aransas and Bosque del Apache NWRs, on Dec. 23, 1987, there were 18 whoopers at the USFWS Patuxent Research Center, one at the San Antonio Zoo, one at the International Crane Foundation's research facility at Baraboo, Wis., and one wild bird near Amarillo, Texas, for a total of 173.

The Whooping Crane Recovery Plan, revised in 1985, sets as a goal for delisting to "threatened" status the achievement of 40 nesting pairs at Wood Buffalo National Park and 25 nesting pairs at two other wild population sites in North America, one in the West and one in the East. At the present rate of production, such a goal could be achieved in the next 25 years with a population of 350-400 birds.

The Patuxent captive population has suffered from disease over the last three years and is down from a high of 38 in 1985. The Grays Lake experimental population is losing an unusual number of migrants (over 30%) to accidents with fences and power lines. Only the Wood Buffalo flock is increasing, and it is vulnerable to winter storms and disease.

Over the last 28 years, almost 200 of these rare cranes have been seen in Montana in more than 45 different sightings. Two-thirds of these observations have been on or within 20 miles of Medicine Lake NWR in extreme northeastern Montana. These birds are migrants from the Wood Buffalo population. In recent years, at least five birds from the Grays Lake population have been spotted in southwestern Montana. In 1985 and '86, a lone female from the Grays Lake flock spent most of the summer at Red Rock Lakes NWR. The last recorded sightings of whooping cranes in Montana were three on April 23 and 24, 1987, near Medicine Lake NWR, and one bird on May 5 and June 4, 1987, in the Centennial Valley between West Yellowstone and Monida Pass.

The DFWP is one of 13 state wildlife agencies along with three USFWS regional offices participating in a cooperative plan to protect whooping cranes during migration. When sightings are called in, the birds are observed to see if they are safe and apparently healthy, and they are watched until they leave the state.

BALD EAGLE (*Haliaeetus leucocephalus*)

Our national symbol has been losing ground for over 200 years. In 1963, fewer than 500 pairs of bald eagles were observed nesting in the whole continental U.S., and the outlook was not encouraging.

Most of their initial decline in the 1800s was due to habitat destruction. Alteration of land near water remains the factor most associated with low bald eagle numbers. Most bald eagles nest within half a mile of a river, lake, slough, bay, or coastal area. Nearly 100% nest within two miles of water. Stout trees and an abundance of regularly available food—fish, waterfowl, rabbits, ground squirrels, and prairie dogs—are vital.

Pollution, pesticide poisoning, collisions with vehicles,

electrocution, shootings, and ingestion of lead shot from waterfowl the eagles eat are responsible for significant bald eagle mortality.

Believing the national symbol was threatened, Congress passed the Bald Eagle Protection Act in 1940. This law prohibited private possession, sale, transportation, shooting, trapping, and disturbance of bald eagles. In 1962, the act was extended to include golden eagles, which are sometimes confused with immature balds. Since 1978, the bald eagle has been covered by constraints of the Endangered Species Act and listed as "endangered" throughout the lower 48 states except in Washington, Oregon, Wisconsin, Minnesota, and Michigan where it is classified as "threatened."

Between 1947 and 1973, bald eagles suffered severely from the use of DDT and related insecticides. These pesticides entered watersheds and became part of aquatic-based food chains. As eagles fed on fish and waterfowl, the breakdown product of these poisons was concentrated and eagle reproduction declined.

BALD EAGLE

Numbers of occupied nests within the seven management and recovery zones (1987)

In 1979, the National Wildlife Federation initiated an annual midwinter bald eagle survey. This event attracts over 4,000 participants and involves counting bald eagles during two weeks in January. These counts indicate that a minimum of 14,000 bald eagles now winter in the United States south of Canada. Nearly three of every four are migrants from Alaska and Canada. Montana's winter count the last few years has averaged about 480 bald eagles (*Montana Outdoors*, July/August 1986).

The latest information shows improvement in the number of nesting bald eagles. In 1987, more than 2,000 pairs nested in 36 states, excluding Alaska. In 1981, the figure was just over 1,400 in 32 states. Figuring one subadult eagle for every nesting pair, the contiguous U.S. now has about 6,000 summering bald eagles.

Bald eagle nesting in Montana has also increased since 1978. In the late 1970s, the known number of nesting pairs varied between 12 and 17. A more intensive survey in 1980 turned up 23 nesting sites; with still more checking, this increased to 37 in 1982. Through summer of 1987, researchers had mapped 85 active and inactive nesting territories. Last summer, cooperators with the Montana Bald Eagle Working Group checked 71 territories and found 60 occupied nests (41 with young), which produced 77 young. About 60% of these birds came from the northwestern corner of the state.

Nationally and regionally, current populations are about halfway to targets identified in recovery plans. The major problems confronting bald eagles today are drainage of wetlands, land developments, and human disturbance. Bald eagles still do not nest in northeastern Montana, where they were historically found. There is unusually poor reproduction in portions of northwestern Montana and concern about the impact of decreasing salmon on Glacier National Park's fall bald eagle concentration.

State biologists are encouraged by the increase of bald eagles in western Montana. But the bird's relatively low reproductive rate, long time to sexual maturity, high juvenile mortality, and limited breeding population in eastern Montana translate into a slow, gradual recovery.

AMERICAN PEREGRINE FALCON
(Falco peregrinus anatum)

The peregrine is the rarest of the 15 species of hawks that breed widely across the United States and Canada.

Before its midcentury decline, the peregrine ranked with the osprey and raven as one of the mostly widely distributed birds in the world. In migration, it has been reported from every major region on earth except Antarctica.

The peregrine is the second largest of the six falcons native

"Majesty on the Wing," © 1978 Robert Bateman. Courtesy of the artist and Mill Pond Press, Inc.; Venice, FL 34292.

to the United States (gyrfalcons are larger, and the other natives are the prairie, merlin, aplomado, and American kestrel; *Montana Outdoors*, Nov./Dec. 1987). Adult males average 15 to 16 inches long, weigh 1-1/4 to 1-1/2 pounds, and have about a three-foot wingspan. Female peregrines are generally one-fourth to one-third larger.

Peregrines have a dark, streamlined appearance; bullet-shaped heads; short necks; powerful shoulders; long, pointed wings; a tapered tail; and large, yellow feet with sharply curved talons. The beak has a conspicuous toothlike projection, and the black feathering on the head looks like a helmet.

On the move, peregrines exhibit extraordinary eyesight, a strong, labored flight, and very fast diving speeds. Because of these and other characteristics, falconers have prized this species for centuries.

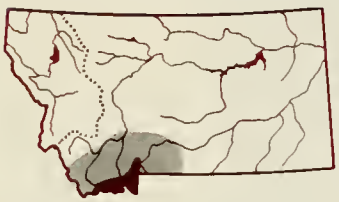
In Montana, peregrines have traditionally nested in cliff areas bordering major watercourses. They prefer to hunt in open areas, feeding almost exclusively on other birds. The peregrine usually kills and sometimes captures its prey in the air.

The severe and rapid worldwide decline of the peregrine between 1950 and 1965 is one of the most remarkable events in environmental biology. Before 1950, researchers estimated between 1,500 and 2,000 pairs of the *anatum* race in North America. But by 1975, a continentwide survey concluded that the *anatum* race was extinct east of the Mississippi and gone from Idaho, Montana, and Wyoming in the West. Only 47 occupied nest sites could be documented in the remaining western states.

The peregrine's worldwide decline focused a great deal of attention on the effects of pesticides. Peregrine/pesticide studies were instrumental in a 1968-69 Wisconsin court action that led to the first statewide ban on DDT. In 1972—the same year the peregrine was listed as "endangered"—DDT and some related pesticides were banned throughout the United States. Since then, research on captive sparrow hawks, black ducks, and ringed doves concluded that DDT induced enough eggshell thinning to cause reproductive failures.

All of Montana's peregrine recovery work has been under contract with the The Peregrine Fund, Inc., which operates from the World Center for Birds of Prey in Boise, Idaho. To date, Montana restoration efforts have centered in the southwestern corner of the state to take advantage of similar efforts in eastern Idaho and northwestern Wyoming.

Every year since 1981, captive-produced peregrines have been re-established into suitable habitat in Montana using a technique called "hacking." It involves confining falcons too young to fly to a large box with one screened side. These hack boxes are placed in areas with plentiful prey. The young are fed in the box for a week or so until they become familiar with their surroundings. When the falcons are ready to fly, the screen is removed. Initially, the birds return to the boxes for food and protection at night. Gradually, they are weaned of provided food and they become independent.



AMERICAN PEREGRINE FALCON

initial recovery zone
reintroduction area

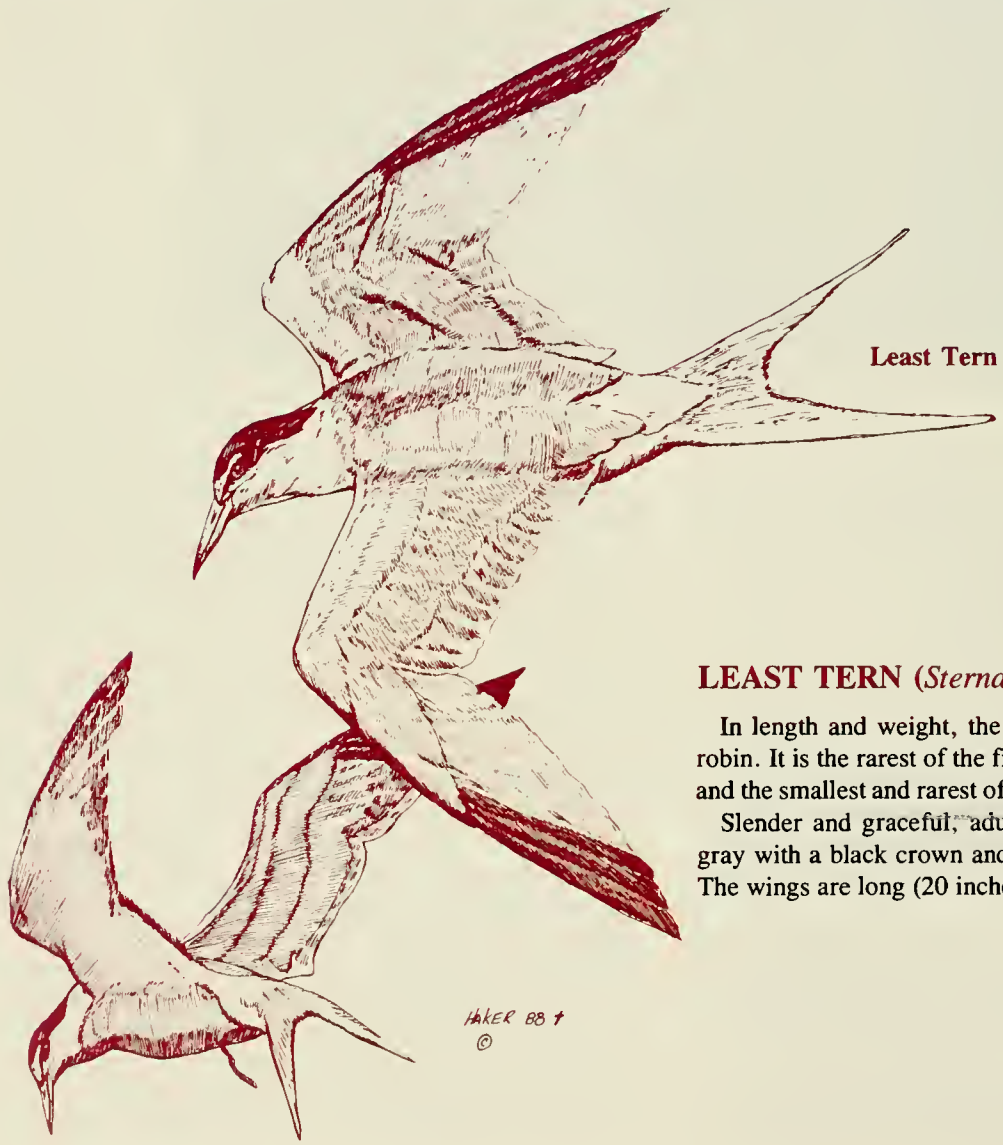
Migrating peregrines have been observed in every Montana county.

Over the last seven years in the Gallatin and Centennial valleys, volunteers from The Peregrine Fund, Inc., have released 93 young peregrines in 20 separate operations. Seventy-five of these birds were successfully fledged. They foraged on their own, and eventually left the release site.

In 1984, two young were fledged by a pair of banded peregrines that had returned on their own to the area. This was the first documented record of production by wild (free-flying) peregrines in Montana in more than a dozen years. Since then, six other wild nestings have produced nine fledglings.

In 1986, the Montana Fish and Game Commission concluded that the experimental phase of the peregrine recovery program had been successful and authorized continuing reintroductions. The plan includes building on this initial success and expanding reintroductions north and east.

So far, peregrine restoration has been Montana's greatest success with an endangered species. Most of this success is due to the work and experience of The Peregrine Fund, Inc., which pioneered and perfected the captive breeding and reintroduction techniques. Credit is also due the active involvement of the Bureau of Land Management, U.S. Forest Service (USFS), National Park Service (NPS), USFWS, and the financial support of Exxon Corporation, the Billings Gazette, and many private donors.



LEAST TERN (*Sterna antillarum*)

In length and weight, the least tern is a bit smaller than a robin. It is the rarest of the five tern species that visit Montana and the smallest and rarest of the 18 terns in North America.

Slender and graceful, adult least terns are white and light gray with a black crown and a distinguishing white forehead. The wings are long (20 inches) and pointed. The tail is deeply

continued on page 34

READERS RESPOND

Management for Wolves and People

Both your article, "All for the Wolf" (*Montana Outdoors*, Sept./Oct. 1987), and the department's current position of non-involvement with wolf recovery ignore one fact that should overshadow all others: Wolf recovery is taking place in Montana *now*. Do wildlife managers have the luxury of debating the fine points of what the law really means or how the endangered species recovery process might work better at a time when wolf recovery is actively happening?

I would argue the state needs to shift into the present tense and play the cards that have been dealt. Because wolves are returning to northwestern Montana, the state has a responsibility to roll up its sleeves and develop a wolf management system that works both for the wolf and the people of this state. Inaction and non-involvement will only guarantee future problems with wolves, and unresolved problems may well translate to hatred and non-acceptance of the animal.

A dose of reality seems necessary here. The sweeping endangered species management changes proposed by the department in your article—such as removing the wolf from the endangered species list throughout its range in Montana—certainly will not happen quickly, if at all. Such a complete overhaul of our national endangered species program would take an act of Congress, and Congress has shown little interest in changing this enormously popular and successful program.

But it's more than simple politics that makes wolf delisting a bad idea. Loss of federal protection has at least two major drawbacks. Although your article fails to mention it, Montana's state endangered species law has no provisions for protecting the habitat of listed species. Anyone who has followed grizzly bear controversies over the last decade knows that the federal endangered species law has been the single most important factor in moderating harmful developmental activities on Montana public lands. Without this legal backstop, the needs of endangered wildlife might often fall prey to special interests and local politics.

Second, if the wolf were removed from the federal endangered species list, the state of Montana would have to pay the costs of wolf recovery. That's distressing, because the success of wolf recovery—both for the animal and for affected citizens—will hinge on developing effective programs both for control of problem wolves and for public education. The department has said wolf recovery money shouldn't come from sportsman license funds; that leaves only the Legislature.

At a time when the Legislature is unwilling to adequately fund programs as basic as higher education, how will wolves fare, given the Legislature's historic disdain both for predators and endangered species? Meanwhile, federal funds remain available for wolf recovery, and were in fact mentioned as a top priority this year in congressional endangered species appropriations legislation.

Whether one is for or against wolf recovery, it's difficult to support the state position of non-involvement. Were I a stockman, I would want to be sure the state was actively involved in developing an effective control program for dealing with problem animals. Sportsmen should want to be sure the state is gathering the kind of data on deer and elk populations in wolf recovery areas that will permit reasoned decisions concerning management of the prey base.

Montanans and others should be heartened by the proclamation that both the department and the state are "All for the Wolf." But if that support is contingent on the management being entirely on the department's terms, then the depth of that commitment must be open to question.—*Hank Fischer, Northern Rockies representative, Defenders of Wildlife; Missoula, Mont.*

Valuable Elk Herd

We enjoyed the article, "The Here and Now Happy Hunting Ground" (Sept./Oct. 1987 *Montana Outdoors*), which presented a down-to-earth view of the elk inhabiting the Missouri Breaks and the Charles M. Russell National Wildlife Refuge.

Author Tom Palmer painted a good picture of the different factors which influence wildlife management and other public use of the area. I'm sure many readers will enjoy this article and come away with a greater appreciation for the values that such a prized elk herd and its habitat represent.—*John R. Foster, Charles M. Russell National Wildlife Refuge; Lewistown, Mont.*

Clark Fork Hurrah

The interesting article, "Clark Fork R_x—Prescription for Renewal?" in the Nov./Dec. 1987 *Montana Outdoors* reminded me of two experiences I had, one in 1930, the other in 1962.

The story describes the extremely dry summer of 1930. I can bear witness to that. As a student from the Pennsylvania State University Forestry Department, I spent the summer of 1930 on the Lewis and Clark National Forest, out of Choteau under Ranger Walter N. Streeter. During the three months I spent there, we experienced only one brief thunderstorm on June 26. Dry indeed, the summer was—as the story relates.

In 1962, my wife and I assembled camping gear and headed for Montana to revisit my old ranger and the mountains I remembered so well. En route we drove along a section of the Clark Fork. I could not resist the challenge of the beautiful stream. I stopped the vehicle, assembled my fly rod, put on my waders, and spent an hour or so flogging the waters, without a single response.

When I related my experience to my Forest Service contacts in Missoula, they laughed at my innocence and informed me that there wasn't a trout in that section of the Clark Fork because of pollution from mining. According to the story, if I were to try the waters there now, I would be much more successful. Hurrah!—*Marlin H. Bruner; Clemson, S.C.*

Love Those Anglers!

by Tom Palmer

More than 14,000 miles of trout streams course through Montana, and about 350,000 anglers annually fish them. You gotta love 'em. Not the trout; you *worship* trout, but these anglers. They are trout fans akin to die-hard baseball fans. They know the difference between slot limits and catch and release restrictions—and how they work and when they should be used by fishery managers—as clearly as Yankee fans know that Billy Martin won't call for the hit-and-run with the bases empty.

"We found that anglers fishing Montana's streams take their fishing quite seriously," said Pat Graham, now in his second season as Fisheries Division administrator for the Montana Department of Fish, Wildlife and Parks (DFWP). "But they take it seriously *and* enjoy it. They know what's behind it all."

During the late summer and fall of 1986 (the year the Mets tripped the Red Sox in a seven-game World Series), the DFWP embarked on its first comprehensive survey of trout anglers on 19 of the state's most popular rivers and streams. Results have been compiled by Dr. Stewart Allen of the University of Idaho.

The information, gathered from 2,173 trout fishermen for the recently released "Angler Preference" survey, actually spawned more than a simple wish list. The survey produced a sharp profile of Montana's trout stream anglers and represents an effort by resource managers to better understand the needs of people who depend on fishing streams for recreation.

By compiling personal details along with the anglers' notions of the practicality of several different resource management options, Graham said the survey represents benchmark information. "This survey is a starting point. It gives us some direction and some idea of how to distinguish the different groups of fishermen we have in this state and their needs and attitudes."

The survey was taken in conjunction with an exhaustive study of the net economic value of trout fishing in Montana that is expected to be released this spring. The preference survey, sent to a random sample of 2,762 resident and nonresident anglers initially contacted in 1985 during DFWP's annual fishing pressure survey, produced a response rate of 81%, more than enough to satisfy statistical accuracy edicts set for similar recreation-based studies.

The questionnaire was specifically fashioned to produce a description of Montana trout stream anglers and to discover how often, and what types of water, they fished. Additional questions were designed to discover aspects of the anglers' most recent fishing trip, including distance traveled and time spent fishing, the type of equipment used, the number of trout caught (and kept), and if a fishing guide was employed.

Anglers were also asked why they chose a particular stream and if conflicts with other recreationists or fishing regulations affected their outings.

"Overall," Graham said, "these anglers are generally satisfied and they're generally successful. They know how to catch fish, and they are well informed about the management of these streams."

The sample showed that an angler

fishing a Montana trout stream is most likely a resident 38-year-old male, with 25 years of fishing experience, who considers trout fishing his favorite, or one of his favorite, activities. He is apt to spend 20 of the 25 days he fishes each year doing so in Montana. He'll rarely hire a guide, and three of every 10 anglers he'll meet on a Montana stream will probably belong to a fishing, sport, or environmental organization.

That's the broad stroke. On site-specific streams, the trout angler profile is often quite disparate. On the Madison River, for instance, 66% of the anglers sampled were nonresidents and more than half said they belonged to a conservation organization. With 12% of those anglers using a fishing guide, the Madison River anglers were three times more likely than the majority of the sample to hire an outfitter.

"It's important to recognize that different streams attract different types of anglers," Graham explained. "The statewide averages are of some value, but we'll use more specific information from anglers on each stream to make site-specific management decisions."

Perhaps some of the most interesting information gathered in the survey concerns what researchers have called the anglers' "desired experience." Although the anglers were obviously going fishing, they said the most important reason for pursuing the activity was not necessarily the fish themselves.

When asked to rank 17 reasons for going fishing from "very important" to "not at all important," 95% of those surveyed said being outdoors was the most important reason for going fishing. A chance to "get away from it all" was runner-up, with 83% of the sample listing that opportunity as very important or important, followed by 82% of the sampled anglers who said viewing the scenery was among the most important reasons for fishing their particular stream. Eighty percent of the sample listed solitude as among the most important considerations for going fishing.

The actual chance to catch a wild trout was very important or important to 78% of the anglers. Catching large trout (61%) and testing fishing skill (57%) appeared to be far more important than catching many fish (37%) and catching fish to eat (37%).

"We have long believed that Montana's wild trout fishery is one of the best in the world, and we want to stay in the forefront of providing those quality outdoor experiences," Graham said. "I think the survey shows that fishing is very important to these people, but that it's a lot bigger than that. It may be related, in part, to an apparent trend on our rivers away from fishing primarily for food to fishing for sport. These anglers are not going to go out of their way to catch fish in a sterile or artificial environment. They're looking for a complete outdoor experience, and we have to recognize that fishing is only one part of the experience."

Although the anglers were generally satisfied with their fishing experiences, many of the respondents noted some problems with management of the river they were fishing. However, an overall consensus on what the problems might be did not emerge. To some, it was too few fish (16%). To others, it was low water levels (14%); too many boats (13%); too many anglers (12%); inadequate access (11%); small fish (10%); poor water quality (7%); poor trout habitat (4%); or too much access (3%).

The information becomes more useful when one looks at the angler response on individual rivers. "Too few fish" was the most commonly checked item on the Bitterroot, Boulder, Flathead, Stillwater, and lower Yellowstone. Water level problems were the common concern on the Beaverhead, Gallatin, Kootenai, and Missouri. "Too many boats" was an irritant on the Big Hole, Madison, Smith, and upper Yellowstone.

"The problems the anglers are seeing are the same problems we see," Graham said. "This part of the survey has provided confirmation of our own observations. However, not all of the problems are under our control. Low water, pollution, and crowding on streams are examples of some things we cannot control, but they are also examples of problems which should concern other public agencies and groups in addition to anglers. We're looking at this survey as a starting point, a tool that will give us some direction when we develop management plans for individual rivers and streams."

For the fishery professionals, however, it was comforting to see that the anglers not only recognized problems, but also understood there are no abracadabra solutions.

For instance, when presented with general strategies and approaches to fishery management for trout streams, 72% of those surveyed opted to protect trout habitat over establishing special regulations (46%), stocking streams (31%), or improving fishing access (19%).

For Graham, it was a particularly pleasing statistic. "It's consistent with the department's priority of maintaining stream habitat," he said. "Trout are rarely stocked in streams in this state, so it's also consistent with the department's program for managing streams for wild trout."

When asked what kind of restrictions they preferred to increase the number of larger trout in the stream, 56% of those sampled said they'd rather keep fewer fish, while 47% said they'd opt for restricting anglers to artificial flies or lures only.

Regarding special regulations that might be needed to increase the number of larger trout in a stream, 64% of those sampled preferred a slot limit—a system which allows anglers to keep a few smaller fish, or one trophy fish, but nothing in between. Nearly half of the sample, however, thought reducing the total limit on fish kept would produce the desired result. Graham said the data appear to show that these trout anglers generally want to be able to keep some fish, but they also recognize that special regulations limiting the number of fish removed from the stream have beneficial effects.

When asked about their most recent fishing trip, 80% of the sampled anglers said they had fished that particular river within the past six months. Seventy-one percent of the anglers said that fishing that stream was the sole purpose of the trip.

Compare that with 95% of the sample who said they planned to continue

fishing that river. At least for trout anglers, familiarity has not bred contempt. In fact, 60% of the sample said they were fishing either their favorite, or one of their favorite, streams. Still, their taste in fishing waters was, by and large, not territorial: 67% of the sample said other Montana trout streams provided a comparable fishing experience.

Forty percent of the sample were exclusively fly-fishermen, but on the Madison (70%), Rock Creek (66%), the South Fork of the Flathead (64%), and the Bighorn (59%), the fly-fishing preference was far higher.

Only 10% of anglers were exclusively bait or lure fishermen, while 40% of the sample said they used a combination of flies, lures, and bait.

The majority of the sample (70%) fished from shore, 18% sometimes fished from a boat and sometimes from shore, while 9% fished from a boat. But no matter where they were casting from, they caught fish. Seventy-eight percent of the sample said they caught fish, and 43% said they had caught a large (18 inches or more) trout.

The most frequent distance traveled was 45 miles and the most frequent amount personally spent per trip was $15. But, when considering the vast distances traveled and money spent by nonresident anglers, the *average* distance traveled was 224 miles, and the average amount spent per trip was $143. Seventy-six percent of the respondents said their fishing trip was worth the amount spent.

Graham said similar surveys are being designed to focus on the attitudes and opinions of lake and reservoir anglers. "These kinds of surveys are going to become a long-term reference tool that will be used to help make future management decisions," he noted. Graham said he expects angler preference surveys to be repeated every four to six years to document emerging trends and changing attitudes.

"Our objective," Graham said, "is to try to provide a diversity of quality fishing opportunities, but in managing our streams and in setting our regulations, we have to keep in mind that 'quality' means different things to different groups of fishermen."■

NONGAME NEWS

BALD EAGLES

Total bald eagle production in Montana last year reached an all-time high: 77 young birds fledged from 58 nests. This represents 1.33 birds fledged per occupied territory, a significant increase over the preceding three years (see chart). The increase in total production has come about because of new breeding territories and a jump in the number of young joining the population from each nest. Active bald eagle nests increased from 38 in 1983 to 60 in 1987, primarily because of young birds setting up new territories. Because it takes several years for young eagle pairs to become successful parents, the total number of young fledged per pair actually decreased over the last few years until this last season.

JAN BONHAM METZMAKER

Montana can actually boast some of the best bald eagle success in the country. Typical brood size for bald eagle nests throughout the United States ranges from 1.3 to 1.6. Since 1978, Montana's average brood size has ranged from 1.47 (1985) to 2.12 (1981). In fact, in 1983, a pair of eagles on the Yellowstone River successfully reared and fledged four young, the first successful rearing of a brood this size ever recorded.

Last year, Montana's bald eagle production finally outstripped California's. While Montana had 60 active nests producing 1.33 eaglets per active nest, California had 66 occupied nests producing only 1.02 eaglets per nest.

Dennis Flath, the department's nongame wildlife biologist, is pleased with these figures: "With this excellent production, I see a bright future for bald eagles in Montana. Although it is too early to say if or when we will meet our planned recovery goals, we are well on our way toward these goals for Montana."

Year	Number of Occupied Nests	Number Young Fledged/ Occupied Nest	Total Production
1983	38	1.52	58
1984	41	1.23	50
1985	50	1.12	56
1986	51	1.07	55
1987	58	1.33	77

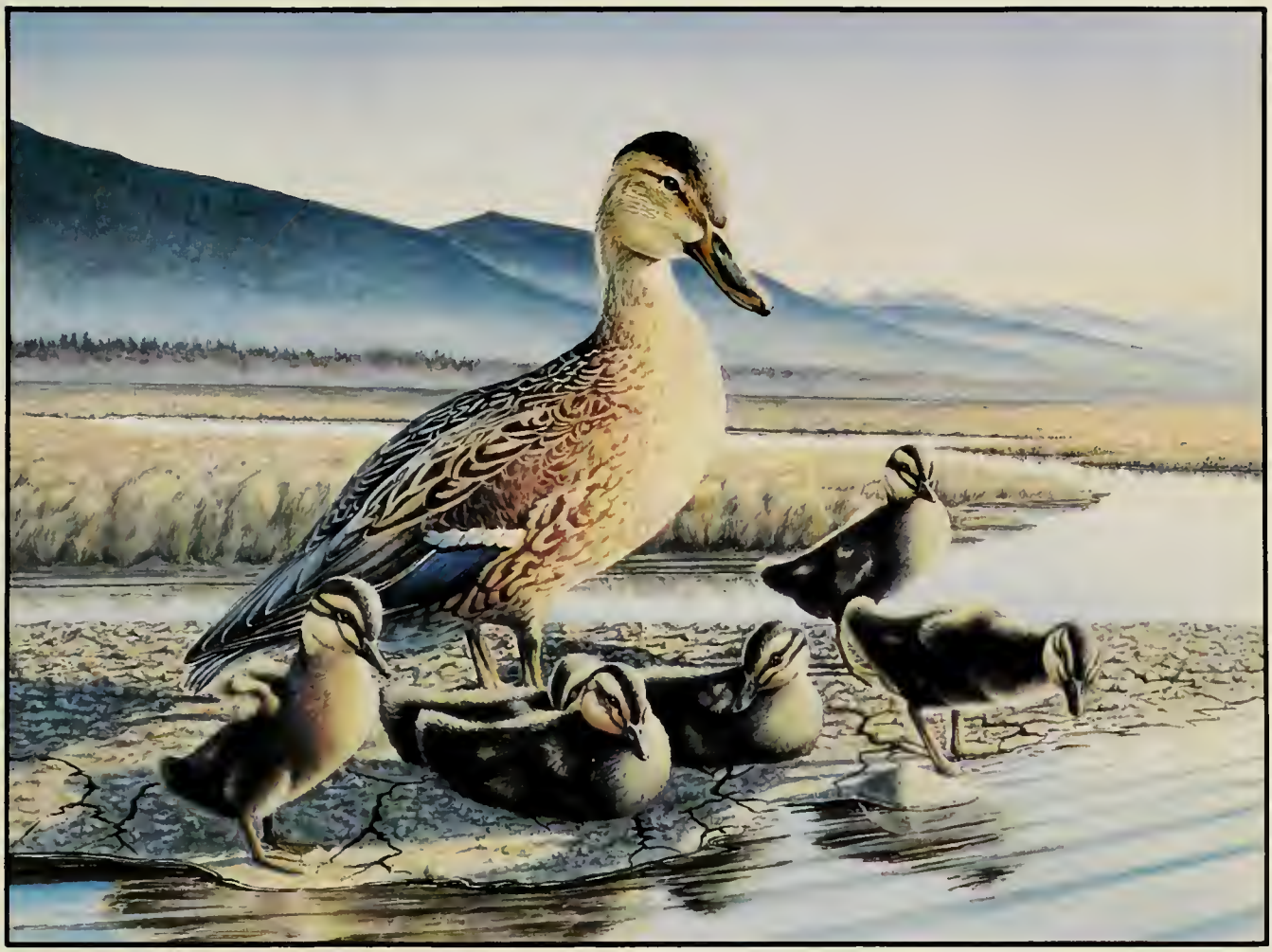
WATCH OUT FOR MARKED BIRDS

From the rare whooping crane and peregrine falcon to the more common rough-legged hawks, bald eagles, and pelicans, many birds in Montana display colored wing markers or leg bands. By marking the birds, biologists can better understand winter migration patterns and follow released birds. If you're a bird-watcher and observe a marked bird, please note the color of the marker, the type of symbol (wings) or pattern (leg bands), and which wing or leg is marked. Report your information to Dennis Flath, Nongame Wildlife Program, 1400 South 19th; Bozeman, MT 59715 (406/994-6354).

NONGAME CHECKOFF STILL TOPS

Of the three checkoffs on Montana state income tax forms, the Nongame Wildlife Program still receives the greatest rate of contributions. For the 1986 tax year, 3,101 donors contributed $24,572, for an average donation of nearly $8 per contributor. The participation rate for eligible donors dropped from 1.1% in 1985 to 0.9% in 1986. Although the average donation increased by 23 cents in the last year, total contributions fell by $7,297.

The checkoff is still a very important source of funds for the state's Nongame Wildlife Program which supports research and management of nongame wildlife in the state. The May/June issue of *Montana Outdoors* will highlight the program's accomplishments. Thanks to the staunch supporters of the program—and please remember the 1987 tax season is upon us again, and your continued support is much needed.



Samuelson's Mallards Win '88 Stamp Contest

by Bill Phippen

Painters, musicians, writers, and other artistic souls who depend on inspiration and sheer natural talent to make a living have in common a never-ending urge to vent their creative passions and, often, a month-to-month concern over how they'll pay the bills. There's something else they share: When the words or images just won't flow onto the page or canvas, copious amounts of time and hard work are demanded to get the job done.

Dave Samuelson, winner of Montana's 1988 waterfowl stamp competition, knows this as well as anyone. "I spent a lot of time on that painting," he said of "Rite of Spring," his winning rendition of a hen mallard and her brood. "Of all the paintings I did last summer, I spent the most time by far on 'Rite of Spring.' But it turned out to be worth it."

Six judges selected it as the best of 24 entries. Other finalists included: Second Place—Connie Tveten, Wolf Point; Third Place—Bob Kercher, Great Falls; Fourth Place—Ron Jenkins, Missoula; Honorable Mention—Steve Aller, McLeod, and Craig Phillips, Thompson Falls. Only Montana residents are eligible to enter.

Samuelson, who was born and raised on a farm near Sioux Rapids, Iowa, has been drawing pictures and has loved art and the outdoors "for as long as I can remember. I love to hunt and fish and have worked as a guide. The time I spend outdoors is time I spend just watching and listening." He works out of his home studio in Missoula.

Although his paintings have been published in several natural resource and sporting magazines and his work is increasingly in demand by private collectors and galleries, he didn't begin to paint seriously until his late 30s. He explains: "I was at a frame shop in Missoula with some of my bird drawings and I ran into Ken Carlson, one of the most respected wildlife painters in America and the illustrator of several books on birds. He asked me if I was doing any bird paintings. I told him I wasn't, and that I really didn't know how to paint. He offered to show me, saying he would show me 'in two days what it would take you two years to learn on your own.' I took him up on his gracious offer and have been painting more and more ever since."

Samuelson was graduated from the Kansas City Art Institute with a bachelor's degree in sculpture and design. He was an assistant instructor of sculpture at the University of Montana while working toward his master's degree in fine arts. He was a runner-up in the 1987 waterfowl stamp competition.

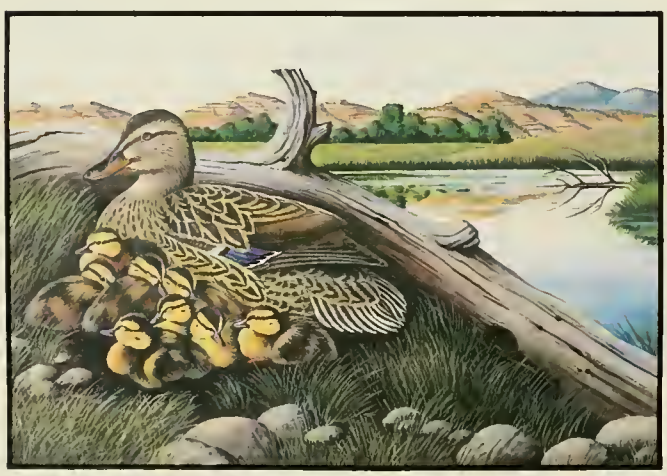
After spending last spring photographing hens and ducklings on lakes, marshes, and even at the local golf course, Samuelson said the best composition model he found for "Rite of Spring" came from a taxidermist's mount he saw several years ago. He said the background was inspired by the Lee Metcalf National Wildlife Refuge near Stevensville.

As the winner of this year's competition, "Rite of Spring" will be reproduced as the 1988 Montana waterfowl hunting stamp, collectors' stamps, lapel pins, posters, and limited edition prints. The 1985 Montana Legislature gave the Department of Fish, Wildlife and Parks (DFWP) authority to produce and sell the waterfowl hunting stamp and to market related items with the proceeds to be used exclusively to develop and enhance Montana's wetlands for the long-term benefit of waterfowl in the state. Since 1986, waterfowl hunters in Montana have been required to possess a state waterfowl stamp, in addition to the long-required federal "duck stamp."

Since its inception, sale of the stamp and related items has generated over $400,000 for Montana's waterfowl habitat enhancement program. The funds have been used on the following projects:

- enrollment of approximately 4,900 acres of private land in north central and northeastern Montana in a "piggyback" lease program. In conjunction with the federal Conservation Reserve Program, these lands will be planted with a seed mix designed to provide dense nesting cover. They will be maintained as wildlife habitat for a 10-year period. The planted lands are adjacent to high-quality wetlands used by waterfowl.
- initiation of an artificial nest structure program. The DFWP has acquired the materials to build 300 nesting platforms for Canada geese, 200 nest baskets for mallard ducks, and 100 nesting boxes for wood ducks. These structures will be placed in suitable privately and publicly owned wetlands throughout Montana.
- construction of shallow-water ponds and establishment of dense nesting cover at Canyon Ferry Wildlife Management Area near Townsend.
- construction of islands to be used by waterfowl at Big Lake Wildlife Management Area northeast of Billings and on several wetlands in Sheridan County.
- enhancement of a reservoir on the Milton Ranch near Roundup, including the fencing of adjacent uplands and construction of an island to increase the reservoir's value for waterfowl production.

Projects such as these funded under the state duck stamp program will also allow Montana to apply for matching funds available through the Ducks Unlimited (DU) MARSH program. The MARSH program provides dollars to the state generated through DU fund-raising events within that state. ■

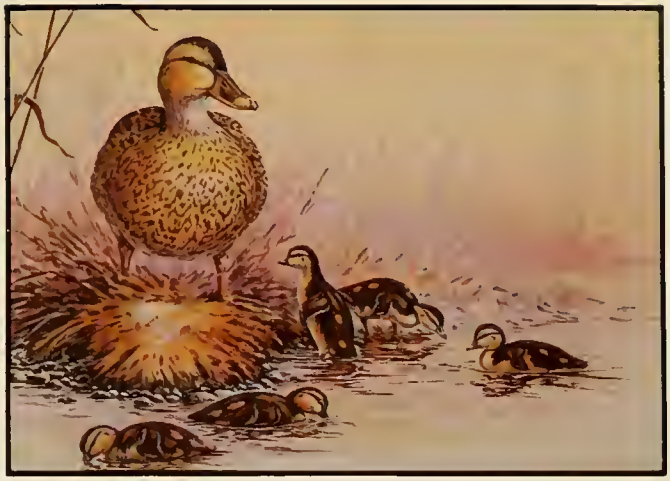


Second Place—Connie Tveten, Wolf Point

Tveten is a full-time painter and wood-carver of waterfowl and birds. She depends on firsthand observation in the field for accurate renderings of wild birds. The excellent hatch of mallards last spring supplied the incentive to enter the waterfowl stamp contest. Tveten exhibits annually at the Charles M. Russell Art Auction, the Easton (Maryland) Waterfowl Festival, and several local shows.

Third Place—Bob Kercher, Great Falls

Kercher has been producing his unusual depictions of the wildlife world for several years. A former teacher, he earned a master's degree in painting and printmaking and turned to the profession full time. Of this painting, he said, "I tried to emphasize the closeness of the family group, the various activities of the little ones, and the protectiveness of the mother." He received an honorable mention in the 1987 contest.

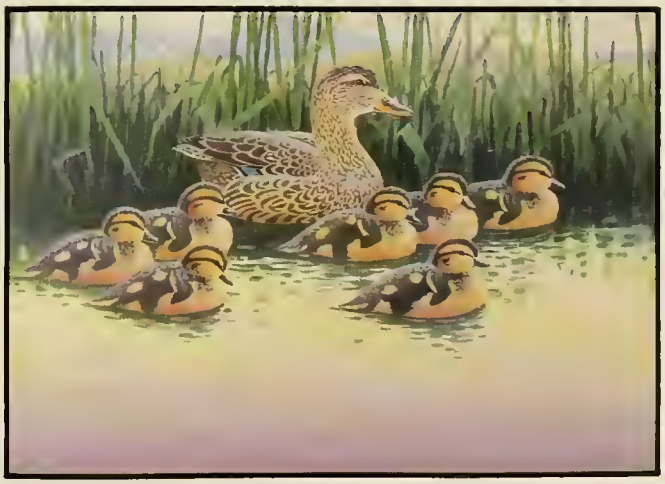


Fourth Place—Ron Jenkins, Missoula

Jenkins' illustrations and paintings have appeared on the covers of more than 50 outdoors magazines; a number of his paintings have been made into prints distributed nationally. In 1965, he won the competition for design of the federal duck stamp, which helped to open doors in the outdoor illustration field. In 1970, he finished second in the federal contest.

Honorable Mention—Steve Aller, McLeod

Aller calls himself a "full-time rancher and half-time painter." He received an honorable mention in the 1987 waterfowl stamp contest, the first state competition he had entered.



Honorable Mention—Craig Phillips, Thompson Falls

Phillips has been a full-time artist for four years. His work is displayed throughout the United States and in Europe. Working both with bronzes and in oils, wildlife is the focus of most of his work.

Whiskey Jack

by Bill Ciesla

The camp is still. You're bushed after a day of trailing that big bull elk through the windfall and all you have to show for it is blisters and a tired body. Weary as you may be, you're suddenly aware that you're not alone.

No, that big elk isn't about to rush into camp. What you sense is more subtle, more insidious. Look up into the lodgepoles and you might catch a quick movement out of the corner of your eye, a streak of gray. You're about to be invaded by whiskey jacks.

They go by many names in addition to whiskey jack: gray jay, Canada jay, and camp robber are just a few. These fluffy-gray birds can provide hours of entertainment or be absolute pests.

Whiskey jacks are birds of the North. In addition to Montana, they are found across all of Canada and north to Alaska. They range south along the Cascades and Rockies to northern California, Arizona, and New Mexico. In Montana and other Rocky Mountain states, whiskey jacks are at home in lodgepole pine country. They are the earliest birds of these forests to nest, often laying eggs by late March or early April.

Like their relatives, the crows, magpies, and the many other jays which inhabit North America, the whiskey jack's diet is highly varied. In fact, they will eat almost anything, including sprouting grasses, buds, insects, seeds, nuts, and berries when in season. Whiskey jacks are about 10 to 12 inches long, have a slate-gray body, a white head, and are accented with black markings on the wings and back of the head. They are the only North American jay with no blue coloring.

Whiskey jacks are best described as bold, brazen mooches, and tales of their antics date to the first mining camps in the Rockies where they earned the name "camp robber" or "camp bird." The name "whiskey jack," incidentally, is the corruption of an Indian name for this bird, "wiss-ka-chon." Pitch a tent among the lodgepoles and sooner or later they will find you. From six to eight usually travel together. Once they discover a campsite, they surround it, flying from tree to tree and limb to limb. Finally, the bravest of the flock dives into camp to pick up whatever food is available—bits of cracker, cheese, nuts, anything edible. Once the ice is broken, the rest of the birds follow, usually coming into camp one at a time to pick up a scrap of food and quickly returning to the cover of the lodgepoles with their prize.

Watching a flock of camp-robbing whiskey jacks can provide great entertainment, especially at dusk when dinner is over, the dishes are washed and stored for the night, and you are ready to take in those last moments of daylight beside the campfire. I have spent many summer and autumn evenings trying to lure them closer and closer by tossing them tiny bits of cracker. With a bit of patience, I have had them come within two or three feet. Occasionally, they will even come into tents looking for scraps of food.

If whiskey jacks are bold in summer, they are even more so in winter when food is scarce. I have encountered them at the beginning of a cross-country ski trip, diving at me from trees until I reached into my pack to toss them a piece of cracker or a handful of trail mix, only to have them greet me at the same place in the same way on the trek out. On one bright winter day, a particularly bold whiskey jack took bites from a chocolate candy bar, right out of my hand.

They seem to know where cross-country skiers or snowmobilers are apt to stop for lunch or camp for the night. Find a group of skiers or snowmobilers taking a snack break and a flock of these mooches is bound to be part of the landscape.

Every now and then, a group of whiskey jacks will be accompanied on its campsite forages by one or two striking blue-black Steller's jays. These handsome birds, with crested heads, are slightly larger than whiskey jacks but not nearly as bold. They stay back in the trees for a while, watching the whiskey jacks forage, before they become brave enough to join them. Steller's jays are also birds of the pine, spruce, and fir forests and range from southern Alaska, south along the mountains of the West, down through Mexico and Central America.

The antics of these bold birds of Montana's piney woods can provide lots of entertainment. If you are camped among the lodgepoles and feel you are not alone, better reach for a bag of nuts or crackers. You're about to have some drop-in company. ■

BILL CIESLA

DAVE BOOKS

A bird of northern conifer forests, the Canada jay—alias whiskey jack or camp robber—likes to visit campsites to see what it can beg or steal.

The Mind of the Fisherman

by John Seidensticker
illustrated by Shirley Cleary

My father is a fisherman. Some of my earliest boyhood memories are of my father coming home after dark, his fish basket lined with grass and full of trout. Newly caught trout combined with freshly pulled grass have a lovely smell. On summer evenings, Father would hurriedly pack us all in the car after work and rush the three miles to the ranch. I remember him returning to the ranch house after dark with his fish basket full of trout and his waders or boots sloshing water. No one worried that it was after dark; we didn't expect him to stop fishing until he could no longer see. If he was a little later than usual in returning, the only remarks I remember from Grandpa or Aunt Nettie were about how the fish really must be biting tonight. Mother didn't say anything—at least in public she didn't say anything.

When I was a boy, Father sometimes took me fishing, although I usually didn't catch fish. As it got dark, I would see all kinds of animals in the logs and snags on the river bank, and the mosquitoes were bad after dark. I lost interest in fish and fishing and, when I was old enough to do so, I found reasons not to go.

This did not set well with Father. If I wasn't going fishing with *him*, then I should just go *fishing*. He bought me fishing gear for birthdays and Christmas. I remember him usually getting around to asking most young women I brought home, "Do you like to fish?" His further interest was directly related to the response.

All the years I was in college, Father urged me to "go fishing." Except when I was in places like the Idaho Primitive Area and Yellowstone National Park, where I could not ignore the large and numerous fish that live in the streams and rivers of these wild places, I remained uninterested in fishing. I like to haul out big fish as well as the next person, but big fish were not what Father had in mind when he told me to "go fishing."

I believe that Father had in mind "the process of fishing" and "the mind of the fisherman." This is what had never caught on in me: leaving work for a different world; getting the gear ready; reading the weather, water, and the fish; casting the fly or the lure—the wholeness of it all coming together as the fish rises to take the perfectly cast fly. Bringing the fish home was never what fishing or being a fisherman is all about. What fishing *is* about is the perfect moment when fisherman, rod, line, water, and fish meet.

It seems not the way of sons to follow their father's advice, however wise. I opted to watch birds. I felt this was a more active pursuit. It was an acceptable—even if questionably acceptable—activity by Seidensticker standards. I could use the fruits of bird-watching in papers I would write. I even got Father involved in a bird-watching project. Bird-watching was an activity I could offer as a counter when he suggested, yet again, that I go fishing. No matter, Father still urged fishing.

Time and events took me away from the clear, fast rivers and streams at the headwaters of the Columbia and the Missouri where I spent the first 30 years of my life. I lived and worked in Nepal, India, Thailand, Sri Lanka, and on the Indonesian islands of Sumatra, Java, and Bali. Father wrote of fishing in his regular letters. He sent me seasonal reports. When he visited me in Nepal, he brought me a rod, reel, and variety of hooks. So I tried fishing in the rivers of the Nepal terai (lowlands). Jim Corbett had written "The Fish of My Dreams" about fishing for mahseer in a nearby river. I didn't catch a fish and went back to watching birds. My cook was very happy to use the rod and reel. Even though he rarely caught a fish, that didn't matter. He was a fisherman.

I think it was at this point, when my Nepali cook was so happy to get a little time off to go fishing, that I began to realize there is an essential difference between fish and fishing. I began to watch fishermen. When I first saw those tall, slender, very dark men with their nets and baskets, I thought little of them. Sometimes we bought fish from them, a welcome addition to our diet of rice and curried vegetables.

Then, I began to see them as fishermen. These men and their families were a caste living in their own village near our research camp; they used their own language. I would stop and watch them ply their trade: They walked carefully together up a small stream, casting their throw nets together, rushing up, and gathering the net for the next stalk and cast, deftly extracting their small catch from the net and slipping it into the round, small-mouthed basket on their hips, plugging the basket top with a grass stopper. Bigger fish, fish the size my father would keep and larger, came from all-night trips they made up and down the river in their dugouts.

Depending on these fishermen for relief from a vegetarian diet prompted me to take a closer look at what was involved in being a fisherman in the Nepal terai. They were a beautiful people using very old methods to catch fish. They would work all night using their dugouts and torches and small spears to make the catch for our camp. They would spend all day, working in teams of three or four, stalking the small streams to catch a few minnows. These were a people, fishermen, fishing for survival. And the catch was usually poor.

These fishermen, and all the fishermen in the tropics using the old ways, are hunters living with the season and the changes in rains, wind, and tides. There are no wasted casts of the net nor is there wasted movement of any sort. They cannot afford extra effort. This is the way of life for the fishermen of

the tropical seas and rivers, the fishermen using the old ways.

I watched fishermen stalk heavy surf on the south coast of Java and easy surf on the coast of Bali. I watched fishermen fishing while clinging to poles surrounded by crashing surf on the south coast of Sri Lanka. I went to the fishing villages—the stilt cities where 10,000 and more people live—along the coasts of the Malacca Strait. People there are born, live, and die over the water, always within the smell of drying fish. In the Sundarbans of Bangladesh, I watched fishermen use trained otters to drive fish into their nets. Otter and man lived most of their lives together on small country boats, fishing in the nadis, gangs, and khals of those storm-lashed tidelands.

For a time I lived on the coast of India at Adyar. I walked the beach and watched the fishermen. For the first time, I talked with them. There was an old man with no family and a young man with a family who lived near my house; I met them almost every day for two months. I joined them when the entire fishing village turned out to help pull in a shore seine. The catch was always small relative to the effort. "Why?" I asked my fisherman friends. They pointed out to sea and told me that bigger boats were taking the fish. When I asked a government fisheries official what was to become of the fishermen living and working from the shore, he answered, "They must change."

It is sad, but the fishermen of Asia that I watched are on the way out; they are as endangered as the tiger and other large mammals I have studied. Dams reduce fish stocks up and down rivers by blocking spawning runs; offshore, motorized fishing boats take stocks that support shore-based fishermen; small inland streams are overfished. Fishing the old way is an endangered livelihood; more than their economic survival is at risk. Where will the fishermen go when the fish are gone? I don't know.

I came home from Asia ready to go fishing with my father. And we did go fishing—it was a fine family trip to Canada. I came down with malaria.

I have not been fishing since. I suspect that one day I will go again, however. Sportfishing, as it has developed and is managed in this country, is a grand example of successful management of a natural resource. I feel the need to participate in this, and not remain apart from it. Consider the fishermen who are not so fortunate.■

"Morning on the Missouri"

continued from page 22

forked like a swallow's. During the summer (the only time least terns are seen in Montana), the bird's legs are bright orange and the bill is yellow and tipped with black. It feeds on small fish and crustaceans by skimming the water surface or by hovering, then plunging into the water headfirst.

Until 1983, the least tern was listed as a race of the European "little tern," but its behavior and calls are much different and it is now considered a distinct North American species. Three least tern populations are recognized: an East Coast group, a West Coast group, and an interior or Mississippi drainage group.

Where plentiful, least terns nest in colonies, with five to 10 breeding pairs per colony. Interior terns prefer nesting on dry, bare sandbars, surrounded by wide, sandy river bottoms. These nesting areas must be near shallow-water feeding areas with good minnow populations.

Tern populations have fallen almost 50% since 1940. Since 1974, the least tern has been on the Audubon Society's "Blue List" of rapidly vanishing birds. The three principal reasons for its decline are: permanent habitat loss, curtailment of favorable habitat by artificial regulation of rivers, and manmade changes in river hydrology. The whole Mississippi drainage has been modified tremendously by construction of dams, creation of reservoirs, channelization of riverbeds, and water management that has caused changes in streamside vegetation. Add pollution affecting fish, the great increase of

predating domestic dogs and cats, and recreation-produced disturbance, and it's easy to understand why the least tern is disappearing.

The West Coast group of California least terns was classified as "endangered" in 1970. In 1975, the Oklahoma Ornithological Society petitioned to add the interior population to the "endangered" list as well. The USFWS replied that more information was needed before the listing process could proceed. In 1984, enough information became available for evaluation, and the USFWS solicited comments from interested groups. A public hearing was conducted, more information was reviewed, and effective June 27, 1985, the interior population was listed as "endangered."

Meriwether Lewis was the first to document terns in Montana. On Aug. 7, 1806, on the Missouri River during his last day in what was to become Montana, he briefly described "...an unusual flight of white gulls about the size of a pigeon with the top of their heads black...." These could have been either least or Forster's terns.

Eastern Montana is believed to be at the very western edge

of the least tern's Great Plains breeding range. The late P.D. Skaar's 1985 edition of "Montana Bird Distribution" lists only two verified sightings: one in 1971 at Canyon Ferry Reservoir near Helena, and one in 1982 near Culbertson in extreme northeastern Montana.

In 1986, birders observed several least terns near the junction of the Yellowstone and Missouri rivers just a couple of miles east of Montana's border. That same year, 14 nesting areas, 43 nests, and 114 least terns were found in neighboring North Dakota. The most productive area was along the Missouri River below Garrison Dam, south to the head of Oahe Reservoir, about 130 airline miles east of Montana.

In summer 1987, observers saw least terns at three locations along the east end of Fort Peck Reservoir. On July 4, one pair was observed nesting on an island with 20 to 30 common terns. The nest contained one egg. The site was checked three and one-half weeks later and the adults were still present, but neither the nest nor young could be found.

Nationwide, the best population estimate is 2,100 to 2,500 interior least terns in 14 states. The first objectives of the least tern recovery plan are to inventory and stabilize the population. About 20 interested biologists and active birders are working to define the bird's range in eastern Montana.

PIPING PLOVER (*Charadrius melodus*)

Effective Jan. 10, 1986, the USFWS listed the piping plover as "endangered" around the Great Lakes and "threatened" along the East Coast and in the northern Great Plains, which includes the eastern half of Montana.

It is the rarest of North America's 14 plovers (pronounced pluh-ver). It is a two-ounce, seven-inch relative of the common killdeer. Like the least tern, the piping plover has specialized habitat requirements which include pebbly, sandy

Piping Plover

places along major watercourses, scoured sandbars, and sandy shorelines with little vegetation. It feeds on a variety of small worms, insects, larvae, and small crustaceans and mollusks.

Its sandy brown color matches its preferred habitat, and it is so well camouflaged that it seems to disappear when still. It is usually seen singly or in small flocks. Its habits are so inconspicuous that the bird is easy to overlook.

During the 1985 debate on its classification, the population was estimated at only 12 to 20 breeding pairs around the Great Lakes. The whole Atlantic Coast population is about 600 to 900 nesting pairs, while the northern Great Plains population is thought to be between 1,000 and 1,200 pairs.

This shorebird is an indicator of how much beaches and rivers have changed. Its decline has been attributed to its specialized habits, water and shoreline development, and human disturbance. Recreational vehicles, unleashed pets, raccoons, skunks, dams, channelization, reservoir inundations, untimely water releases, dewatering, and modification and stabilization of sandbars and shorelines have all been blamed for loss of piping plover habitat.

More than half of the Great Plains population of piping plovers nests in Saskatchewan and Alberta. The Canadian Committee on the Status of Endangered Wildlife classified the little plover as "threatened" in 1978 and "endangered" in 1985.

In 1982, the USFWS listed the piping plover as a "Category 2 Species"—a candidate for possible listing for which more information was needed. In fall 1984, the USFWS re-proposed the listing, and requested comments.

In the West, considerable opposition to listing came from water interests which feared compromise of future developments for irrigation and flood control. This opposition was countered by over 170 government agencies, conservation organizations, and other interested parties. The USFWS compromised by not proposing any critical habitat restrictions until more was known about the piping plover.

PIPING PLOVER

1987 survey area

1987 observation areas

Very little is known about the piping plover in Montana. The 1985 edition of Skaar's "Montana Bird Distribution" lists only 19 documented sightings for Montana. Fort Peck bird-watcher Chuck Carlson is credited with finding Montana's first documented piping plover nest on the face of Fort Peck Dam in the late 1970s.

During the last two years, a group of about 20 active birders, volunteers, and agency biologists have attempted to better define the piping plover and least tern range in northeastern Montana. In 1986, the group found a total of 76 piping plovers—19 pairs, 20 nests, and 23 immature birds.

In 1987, an expanded group worked almost 400 hours surveying over 300 miles of shoreline in 12 counties. The group found 74 adult plovers, 19 nests (12 successful), with 24 to 31 young. In both 1986 and '87, they saw most of the birds around Medicine Lake NWR and associated wetlands in Sheridan County, at Nelson Reservoir east of Malta, and on the C.M. Russell NWR at the east end of Fort Peck Reservoir.

GRIZZLY BEAR (*Ursus arctos horribilis*)

No threatened or endangered animal in Montana has received more publicity than the grizzly bear. At least one news item has appeared every week for the last five years.

The grizzly bear was classified as "threatened" in the United States south of Canada on Sept. 1, 1975. Since, almost continual discussion has swirled about the animal's status and population in Montana. The following summarizes recent information.

GRIZZLY BEAR

Grizzly bear ecosystems in Montana

Portions of four distinct grizzly bear populations inhabit Montana. By far, the largest is the population centered along the northern Continental Divide, which borders grizzly habitat in Canada. The U.S. portion comprises about 6 million acres and includes Glacier National Park; the Bob Marshall, Great Bear, Scapegoat, and Mission Mountains Wilderness areas; and parts of the Flathead, Kootenai, Lolo, Helena, and Lewis and Clark National forests and portions of the Flathead and Blackfeet Indian reservations. The latest estimate is 549 to 813 grizzly bears in the Montana section. The figure, based on extrapolations from at least five different grizzly studies, was published by the DFWP in March 1986 in its 287-page environmental impact statement on the grizzly bear in

northwestern Montana.

The Cabinet Mountains-Yaak River grizzly population lives in the far northwestern corner of Montana and portions of the Idaho Panhandle and British Columbia. The grizzly habitat in the United States covers more than 1 million acres, mostly in the Kootenai National Forest. Wayne Kasworm, DFWP grizzly researcher, estimates the number of grizzlies in this area at between 25 and 50.

The Yellowstone population occupies about 5-1/2 million acres in and around Yellowstone National Park. Most of this

Grizzly Bear

population is in Wyoming. Its size has been the subject of heated debate for more than 20 years. Most current estimates range between 200 and 300 animals, of which fewer than 100 are within Montana's borders. The Montana grizzlies of this population mostly inhabit the Gallatin and Beaverhead National forests.

A few grizzlies may inhabit Idaho's Selway-Bitterroot Wilderness Area. Fewer than 250,000 acres of this wilderness area extend east into Montana. Only a few credible observations have been made, and the grizzlies seen may be transients and not permanent residents. In any case, what little is known indicates fewer than 20 grizzlies.

The northern Continental Divide population is stable, and may be increasing. The Cabinet Mountains population is believed to be decreasing, although grizzlies in the Yaak River drainage appear to be benefiting from immigration of Canadian grizzlies. Judging from recent female and cub grizzly observations in Yellowstone National Park, the population appears to be increasing slightly. Insufficient information makes determination of the status of the Selway-Bitterroot population impossible. In summary, Montana has at least 600 grizzlies and could have as many as 900.

The USFWS, the NPS, and the DFWP are discussing the possibility of delisting the grizzly in Glacier National Park and in portions of the northern Continental Divide grizzly bear ecosystem.

Another joint proposal by the USFS, NPS, USFWS, and DFWP would add a few bears to the Cabinet Mountains grizzly population, with the idea of testing two placement techniques. One involves releasing subadult females with no history of human involvement into good feeding situations, and the second involves placing zoo-born female cubs into the dens of black bear females. The USFWS has written an environmental assessment on this proposal and it is being discussed with the public right now.

A new grizzly study was started in 1987 in the South Fork of the Flathead to measure long-term population trends, to test the reliability of current estimates, and to identify factors limiting grizzlies. This project includes satellite tracking and use of photo-recapture techniques.

The 1982 federal grizzly bear recovery plan is being updated and a new plan should be out by the end of this year. All grizzly work is now coordinated by a high-level Interagency Grizzly Bear Committee and this has resulted in improved planning, research, and management.

GRAY WOLF (*Canis lupus irremotus*)

Throughout the world and for hundreds of years, wolves have been relentlessly persecuted. The introduction of strychnine in the late 1800s made it possible to exterminate wolves. Except for a few around the Great Lakes and northern Appalachia, they were eliminated from eastern North America by 1900. In fall 1914, the federal government began a wolf control program in the western U.S. that did away with surviving wolves in most of the plains and mountain states by 1930.

Wolf packs in Montana were eliminated by 1926. The Department of Fish and Game continued to receive regular wolf reports until 1933. Between 1940 and 1965, the department received only occasional reports, but in the late 1960s, the number began to increase.

In 1973, University of Montana (UM) forestry professor Robert Ream started the Wolf Ecology Project to gather and

GRAY WOLF

Recovery areas in Montana in the 1987 Rocky Mtn. Wolf Recovery Plan

Area known to be inhabited by wolves (1987)

"Wolves on the Trail," © 1983 Robert Bateman. Courtesy of the artist and Mill Pond Press, Inc.; Venice, FL 34292.

disseminate information about wolves in the northern Rocky Mountains. The project collected 424 wolf reports from Montana, Idaho, and Wyoming between 1972 and mid-1979.

Since 1979, one or more wolves have been sighted in the Flathead Valley on the west side of Glacier Park. In 1986, a pair produced a litter of five in Glacier, south of Polebridge, Mont. This was the first documented evidence of wolf production in Montana in more than 50 years.

In 1987, a pack again denned in Glacier and produced a litter of six. Two other pairs denned just north of the Canadian border and added nine or 10 pups. A fourth pack of seven or eight roamed Glacier east of the Continental Divide. In all, by the middle of July 1987, at least four packs and more than 30 wolves were inhabiting the area in or close to Glacier.

During summer, the pack east of the divide got into trouble on the Blackfeet Reservation. The adults and four young-of-the-year killed at least two cows, a yearling steer, nine sheep, and one lamb. Two of the offending wolves were trapped by federal animal damage control agents and sent to a research facility in Minnesota, and five were killed after trapping failed.

Last fall, in the southeastern corner of British Columbia, the Ministry of Environment opened a wolf hunting season. Wolf seasons had been open in neighboring B.C. areas for four years, and only three wolves had been harvested. During the first part of last year's hunt, seven wolves were killed in the Wolf Ecology Project's study area alone. Included were three breeding-age females. B.C. officials closed the season Oct. 23 to protect wolf recovery efforts in the United States.

According to the Wolf Ecology Project, as of Dec. 31, 1987, 22 wolves (12 pups, three yearlings, five adults, and two unknown) in four packs were known to have occupied the North Fork and Wigwam River drainages of British Columbia and Montana. Eight of these animals had radio collars.

Montana's wolf situation was summarized in the Sept./Oct. 1987 issue of *Montana Outdoors*. Last year, the state of Montana refused to sign the Northern Rocky Mountain Wolf Recovery Plan. The governor's letter listed three major concerns: (1) the state's need for adequate management flexibility to control wolf numbers and distribution, (2) the need for assured federal recovery goals, and (3) adequate federal funding to implement the federal plan.

The position was based primarily on Montana's 12-year experience with the "threatened" grizzly and Minnesota's experience with 1,200 "threatened" wolves.

The DFWP has offered to proceed with wolf management under authority of the 1973 Montana Nongame and Endangered Species Act and integrate wolf monitoring, management, and recovery into its wildlife management program. So far, this approach has not received active consideration.

Attitudes about the wolf are changing, at least in western Montana. Two 1987 Montana wolf surveys—one by the Great Falls Tribune sampling 408 residents, and one by a UM graduate student sampling 164 North Fork residents and 366 Flathead County hunters—indicated the majority of those polled felt surprisingly positive about wolves.■

FORESTS ARE MORE THAN TREES

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